



**African Water Facility**  
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*Mobilising Resources for Water in Africa*  
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# Project Appraisal Report

## **The Republic of Seychelles**

### **Seychelles Integrated and Comprehensive Sanitation Master Plan**

### **Project Appraisal Report**

**December 2014**

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**African Water Facility | Facilité africaine de l'eau**

**African Development Bank | Banque africaine de développement**

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## List of Acronyms

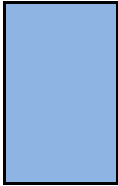
ABR	Anaerobic Baffled Reactor
AFD	French Development Agency
AfDB	African Development Bank
AWF	African Water Facility
CCTV	Closed Circuit TeleVision
DoE	Department of Environment
EIB	European Investment Bank
EN	European Norm
ESIA	Environmental and Social Impact Assessment
GIS	Geographic Information Systems
HH	Household
ICSMP	Integrated and Comprehensive Sanitation Master Plan
IUWM	Integrated Urban Water Management
MBR	Membrane Bio Reactor
MBBR	Moving Bed Biofilm Reactor
MDG	Millennium Development Goal
MoF	Ministry of Finance
MoH	Ministry of Health
MoLUH	Ministry of Land Use and Housing
MoTC	Ministry of Tourism and Culture
O&M	Operation and Maintenance
PMU	Project Management Unit
PO	Private Operator
PUC	Public Utilities Corporation
RBC	Rotating Biological Contactor
SBR	Sequencing Batch Reactor
SAA	Seychelles Agricultural Agency
SC	Steering Committee
SESA	Strategic Environmental and Social Assessment
SEYFA	Seychelles Farmers Association
STP	Sewage Treatment Plant
TA	Technical Assistance
UASB	Upflow Anaerobic Sludge Blanket
WWTP	Wastewater Treatment Plant

## II. Logical Framework

<b>Country and Project Name:</b> Seychelles Comprehensive and Integrated Sanitation Master Plan						
<b>Purpose of the project:</b> Provide the Seychelles Government with a tool that will allow the development of vision and strategy for the Seychelles and to mobilise financing for the implementation of sustainable sanitation facilities.						
Results chain		Performance indicators			Means of verification	Risks/mitigation measures
		Indicator	Baseline	Targets		
		(including CSI)	2014			
Impact	Seychelles Environment is improved	Water quality standards (sea, surface water, groundwater) fulfilled	Unknown; simplified monitoring programme ongoing	100% (2040)	Water quality monitoring reports	Sustained Government support for all new and on-going sanitation sector-related activities and programmes
	Health and sanitary conditions are improved at targeted islands	Occurrence of water borne diseases	1432 cases per year	Reduction by 90% (2040)	National statistics, Ministry of Health	
Outcomes	Funds mobilized by PUC for the sanitation projects prioritized for the first 5 years of the Master Plan.	Funds pledged (letter)	0	100% of investment needs for the first five years (2021)	Minutes of Donor conferences AWF annual survey	Risk: Limited donors' commitment to the sewerage sector Mitigation: Involve donors early in the study  Risk: Political acceptability of higher tariffs
	The Master Plan promotes Innovative and alternative approaches to sanitation	Master Plan includes demand side measures	No	Yes (2016)	Consultant's reports	
		Master Plan includes use of reclaimed water	No	Yes (2016)		
		Master Plan includes reuse of sludge from wastewater treatment	No	Yes (2016)		

			Master Plan includes non-traditional technologies	No	Yes (2016)		Mitigation: Awareness creation activities for decision makers
Output	1	Main stakeholders are aware of the value of an integrated, comprehensive sanitation planning approach	% of members of Consultation Committee aware of integrated, comprehensive sanitation planning approach value	TBD; assessment by TA survey	80% based on TA survey (2016)	TA Surveys	Risk: Consultants may not deliver reports of adequate quality Mitigation: Support by TA  Risk: Lack of acceptance of innovative technologies, systems by stakeholders Mitigation: Awareness creation activities, study tour, conference on innovative technologies and solutions, consultative committee meetings, public meetings
	2	Government, PUC and Stakeholders approve an integrated comprehensive sanitation master plan (including preliminary designs)	Decision of the Steering Committee	No ICSMP	ICSMP Approved by Consultative and Steering Committees (2016)	Minutes of Steering Committee (Project completion report)	
	3	Cost effective projects are identified for submission to various funding agencies	Investment programme disaggregated into standalone project packages	0	100% (2016)	Final project report	

Key activities	Components	Inputs
	<p>Component 1 Comprehensive Integrated Sanitation Master Plan</p> <p>Phase 1 – Diagnosis</p> <p>Phase 2 – Scenarios Comparison</p> <p>Phase 3 – Master Plan</p> <p>Component 2 Consultation and Project Management</p>	<p>Component 1 - ICSMP EUR 946,000</p> <p>Component 2 - Project Management EUR 425,100</p> <p>Contingencies EUR 68,555</p> <p>Total EUR 1,439,655</p>

	Project Management	AWF EUR 1,073,100
	Stakeholders Consultation, Community Participation	PUC EUR 366,555
	Technical Assistance	

### **III. Executive Summary**

1. Only approximately 15% of all households in the Seychelles are served by piped waterborne sewerage systems, while the remaining population depends on on-site sanitation facilities in the form of septic tanks and pit latrines. The existing networks and treatment plants are partly very old and in poor condition. Septic tanks are often not functional and represent a risk for contamination due to poor design and unfavourable underground conditions.
2. The Seychelles' economy depends vastly on tourism and fisheries and the country cannot afford any contamination of the coastal area. In addition, the last ten years have seen a boom in the construction of residential houses and touristic establishments, which has significantly increased the stress on limited environmental resources, especially water.
3. Sanitation is very much linked to the water supply, energy and waste sectors. The AWF funded Water Supply Master Plan (2011) estimated that the water deficit will reach 30,000 to 40,000m<sup>3</sup> in 2030 and identified investments (including desalination plants) and demand management measures amounting € 100 million to cope with this major national issue. In this context, wastewater reclamation and reuse can lead to significant savings in required investments. Water conservation measures also reduce the wastewater flow and consequently the sanitation infrastructure costs. On the energy side, the Seychelles depend almost exclusively on imported fossil fuel for electricity generation, and sludge represents a resource which could help reduce the national energetic dependence through a waste-to-energy value chain.
4. The objective of the proposed project is therefore to develop an Integrated and Comprehensive Sanitation Master Plan (ICSMP) for the three main islands of Seychelles, fully mindful of the synergies with linked infrastructure sectors – water supply, drainage, solid waste and energy – and other concerned areas like agriculture, land use planning, tourism and economic development in order to accelerate the achievement of the National Sustainable Development Strategy.
5. This Master Plan will help the Government and PUC develop a strategy for the sanitation sector for the next 25 years based on a new paradigm: "waste is a resource". This strategy will be comprehensive as mentioned above and will in particular address the legal and institutional frameworks as well as PUC financial sustainability. Recognizing that future is uncertain it will take into account changing constraints and opportunities.
6. PUC also needs a tactical document that will define the investments and accompanying measures needed to implement the strategy for the next 10 years (including tariff revision, awareness campaign, coordination of agencies, etc.). This document will be aimed at mobilizing donors' support.
7. The project comprises two main components, namely:
  - Development of the Integrated and Comprehensive Sanitation Master Plan, and
  - Project Management, consultation and communication.
8. Component 1, the development of the Integrated Comprehensive Sanitation Master Plan, will be based on an integrated planning approach. It will start with analyzing existing framework conditions, and continue with the development of different sanitation scenarios which will consider varying degrees of demand side measures, use of reclaimed water and reuse of sludge, decentralization and in general synergies with other relevant sectors, like solid waste, urban planning ,etc. It will be based on innovative technological options. Based

on the outcome of the scenarios development and comparison phase, an informed decision for a Master-Scenario will be made, which will then be developed into a 10 year Master Plan. The flexibility of the planning approach as well as its effectiveness will be enhanced by an institutionalized monitoring system, with a continuous feedback into a regular review process.

9. Component 2 comprises project management, stakeholder consultation, community participation and technical assistance. A sound consultation process will be implemented in the form of (i) a consultative committee with the main stakeholders for discussing the results of the study, and (ii) a series of public meetings, meant to get a direct feedback from the population. Furthermore, Integrated Urban Water Management (IUWM) is a concept which is rarely used by Consultants and there are very few companies with significant references in this field. PUC and the Consultant for the implementation of Project Component 1 will therefore be supported by a Technical Assistance (TA) in IUWM and innovative and alternative sanitation technologies.

10. The Recipient of the AWF grant for the studies will be the Government of Seychelles and the Public Utilities Corporation (PUC) will be the Implementing Agency. The project will be implemented over a period of 24 months.

11. Based upon a critical assessment of the relevance, effectiveness, and sustainability of the project, as well as the credibility and capacity of the Implementing Agency, it is recommended that a grant of € 1,073,100 from the AWF be extended to the Government of Seychelles for the implementation of the Integrated and Comprehensive Sanitation Master Plan of the Seychelles. The total project costs amounts € 1,439,655, out of which PUC will contribute to € 366,555.



# **1 Background**

## **1.1 Project Rationale and Origin**

1. The Seychelles population reached 88,300 inhabitants in 2012, out of which 86% live on Mahé Island and most of the others on Praslin and La Digue Islands. More than 230,000 tourists visited Seychelles in 2013, an increase of 11% compared to the previous year.
2. Over the past 5 years, Seychelles has successfully achieved a high economic growth rate (GDP average growth rate of 5% between 2011 and 2014<sup>1</sup>). The key pillars of the economy are tourism and fisheries. This rapid economic and demographic growth, which has taken place since the early 90's is having a significant impact on the environment.
3. To address the issue of environmental protection, the Government prepared Environmental Management Plans in 1990 and 2000 which identified clearly the main problems faced by the sector and were the base of investments in water-borne sewerage systems. By 2010, the demand for sewerage services had escalated, in particular due to developments outside of the sewered zones, and the infrastructure deteriorated to the point where an urgent evaluation of the system was considered necessary to determine how best to cope with the situation. PUC commissioned a study in 2011 to assess the needs for the rehabilitation works and the requirements to expand the network to cover other sensitive areas. The study also looked at the possibility of setting up other piped sewerage facilities to cover Mahé, Praslin and La Digue. However, the study was limited in scope and did not address the entire complexity of the current situation.
4. In parallel, a number of other initiatives that may impact the development of sanitation infrastructures are undergoing, among them (i) the development of an Urban Master Plan for Victoria, and (ii) the call for bidding for a waste-to-energy public-private-partnership, which considers the reuse of sludge from sanitation systems.

## **1.2 Sector Status and Priorities**

5. According to the last census 100% of the houses on Mahé, Praslin and La Digue were served by some form of sanitation system. This means, that the Seychelles have already achieved the Millennium development Goals (MDGs) in terms of sanitation. However, only 15% of the population is connected to water-borne sewerage systems with the rest of the dwellers being served by on-site systems, mainly septic tanks & soak pits. Unfortunately, many of these individual systems are not properly functioning and constitute a significant source of pollution. Some of the large hotels located outside the sewered areas have their own sewage treatment systems.
6. The Seychelles Sustainable Development Strategy (SSDS 2011-20) clearly highlights the need to address sanitation in a comprehensive and integrated way by emphasizing "recycling of some types of wastes" and warning against increase in waste output, lack of water and increased electricity consumption. Sanitation and waste are considered as cross-sectoral linkages in all strategic objectives of the SSDS. Integrated water resources management is

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<sup>1</sup> Source: Central Bank of Seychelles

one of the guiding principles of the SSDS, activities like the promotion of the reclamation and reuse of wastewater are explicitly stated to achieve the SSDS strategic objective.

7. The SSDS focus on the expansion of the sewerage networks to high density areas and the phasing-out of non-functioning septic tanks as well as integrated solutions for Praslin and La Digue. Pollution from ageing sewers and non-functioning septic tanks and lack of appropriate sewage treatment systems are considered to be the main challenges.

8. The Public Utilities Corporation (PUC) of the Seychelles was established by the Public Utilities Corporation Act 1986 for the supply of electricity and water and the provision of sewerage services. An organisational chart is attached in annex 0.

9. Other major stakeholders in areas relevant for the development of the ICSMP are summarized in Figure 1.

### 1.3 Problem Definition

10. The Seychelles economy depends vastly on tourism and fisheries. The last ten years have seen a boom in the construction of both residential houses and touristic establishments. This rapid economic and demographic growth is having a heavy toll on the environment. As a result, the need to preserve the country's fragile environment, and in particular reduce the stress on already scarce water resources has been recognized as one of the challenges which have to be addressed for the country to continue with its economic growth.

11. However, while having achieved a sanitation coverage of nearly 100% in relation to the MDGs, the coverage with functioning sanitation systems is low, with only 15% of the population being connected to a sewer system with treatment plants and the remaining households, hotels, resorts, etc. using mostly septic tanks with limited effectiveness. The result is a high rate of occurrence of water borne diseases. The 1432 cases per year reported in the logframe are the positive confirmed cases from samples sent for lab-analysis only; the actual number is probably higher.

12. Furthermore the AWF funded Seychelles Water Supply Master Plan shows that the water deficit will reach 28.000 to 40.000 m<sup>3</sup>/d in 2030 if nothing is done to meet the water needs. The Master Plan proposes a traditional set of investments in new dams and additional desalination plants as well as demand management measures aimed at meeting the 2030 demand. The Bank fielded an appraisal mission in November 2014 for the raising of the La Gogue Dam, which is one of the measures proposed by this investment plan. About €100 million will be needed to mobilize additional conventional water resources. In this context, any sewage re-cycling scheme could show a fair economic justification through reducing costly investments.

13. Stormwater which may be a possible resource for water supply is not yet taken into consideration.



Figure 1: Stakeholders in the development of the ICSMP

14. Climate Change will exacerbate the current problems with water supply and sanitation, since studies predict increased occurrences of extreme weather conditions resulting in extended durations of draughts as well as more frequent flooding of existing sanitation infrastructure.

15. On the energy side, the Seychelles are almost entirely dependent on fossil fuel imports. However, the Sustainable Development Plan for the Seychelles prioritizes the development of renewable energy. This is relevant for sanitation systems as both a consumer of electricity and a potential source for renewable energy. Therefore, it will be necessary to develop a sanitation master plan based on an integrated and comprehensive approach to map out how PUC should develop the sanitation system(s). The master plan will go beyond being a one-dimensional investment plan and become a tool to contribute to a variety of different objectives: from reducing the stress on water resources by using reclaimed water and stormwater as a resource, to minimizing greenhouse gas emissions by considering the energy value of organic wastes and minimizing the energy demand of sanitation systems.

16. For the sake of this project, the term “sanitation” covers sewerage and faecal sludge management. Solid waste management will be included as far as the identification of synergies with the ongoing waste-to-energy initiative is concerned. Stormwater will be addressed with its effect on existing and planned sanitation infrastructure and its potential utilisation as a resource for rainwater harvesting and groundwater recharge.

#### **1.4 Beneficiaries and Stakeholders**

17. The direct beneficiaries of the project will be PUC as well as other concerned ministries and public entities. Indirectly the beneficiaries will be:

- the population of the three main Islands of Mahé, Praslin and La Digue (88,300 inhabitants in 2012), which will be targeted by the study (improved sanitation service, improved environmental conditions)
- the tourism industry (improved sanitation service, improved environmental conditions, use of reclaimed water)
- farmers (use of reclaimed water for irrigation, reuse of compost as soil conditioner and fertilizer)
- production industry (use of reclaimed water; savings for freshwater consumption)

#### **1.5 Lessons learned**

18. From the Seychelles water supply master plan, AWF funded, two main lessons learned were drawn:

- The participation of stakeholders was essential to understand their expectations and to engage them in the project. It facilitated their ownership and commitment to the project.
- The donors’ conference was very successful as donors committed to funding around 88% of the investments planned. This success was mainly due to PUC’s ability to early engage with donors during the studies. This allowed the financiers to make firm decisions regarding the project funding before the donors’ conference.

19. This lessons learned are mainstreamed into this project through a comprehensive consultation process and the inclusion in the terms of reference of the main consultant of activities related to donors' mobilisation.

## 1.6 Justification of AWF Intervention

20. The AWF's strategy focuses on supporting project preparation, water governance and water knowledge projects to help African countries to meet the goals and targets for the water and sanitation sector set by the Millennium Development Goals 2015 and the Africa Water Vision 2025. The proposed project is well aligned with the Africa Water Vision 2025, in particular as far as sustainable access to safe and adequate water supply and sanitation, adequate quantity and quality of water for sustaining ecosystems and biodiversity, effective and sustainable strategies for addressing natural and man-made water-resources problems, including climate variability and change, and public awareness and commitment for sustainable water-resources management are concerned.

21. The project is in line with the AWF Strategic Priority 1 'preparing investment projects'. The identification of cost effective projects for submission to various funding agencies will be a direct output of the proposed project. Under Strategic Priority 2 the Facility supports the development of policies, strategies, plans and instruments at local, national, regional, and transboundary levels. The proposed project is also in line with this strategic priority.

22. The AfDB strategy 2013-2022 formulates two objectives; the second objective is to ensure that inclusive growth is sustainable. One of the five operational priorities is infrastructure development. The proposed project obviously contributes to this strategy by basing the infrastructure development on an integrated planning approach with a strong focus on making infrastructure sustainable. Furthermore, the Seychelles' Country Strategy Paper 2011-2015 considers the limited availability and access to adequate water and sanitation services to be a bottleneck for the development of other sectors. The project will in this sense support the Country Strategy Paper's subcomponent 1, which is infrastructure development.

23. The Integrated Seychelles Water and Sewerage Master Plan closely links with the objectives of the Seychelles' 2011 -2020 National Sustainability Plan as indicated in Figure 2.

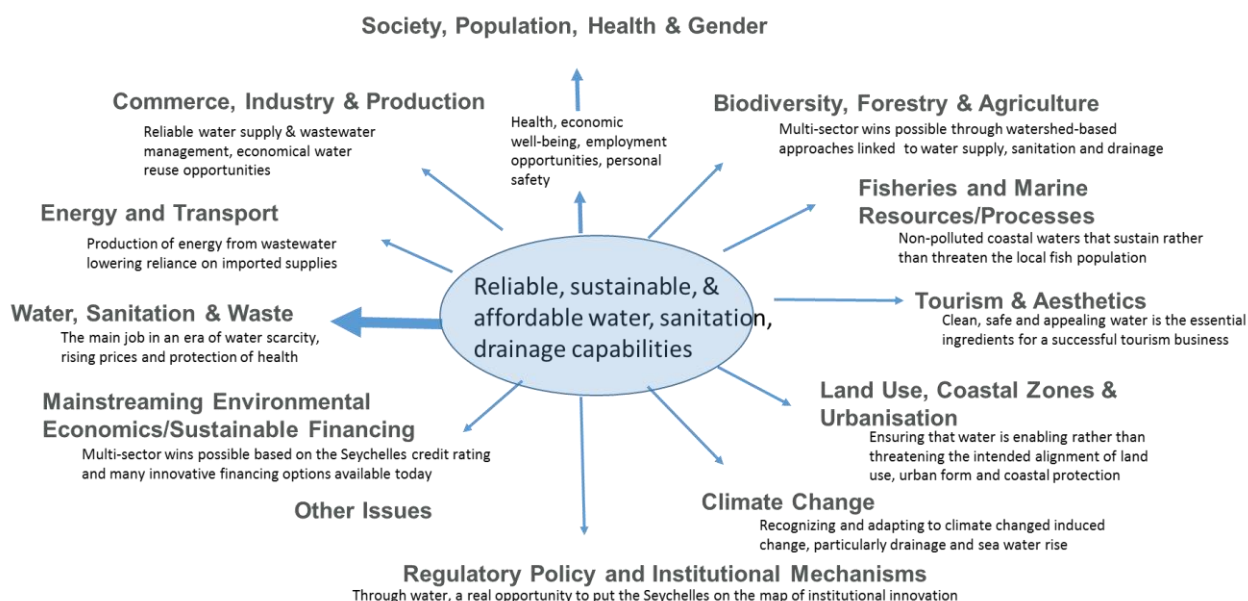


Figure 2: ICSMP's links with the Seychelles Sustainable Development Plan 2011-2020

24. The project is also in line with SADC Regional Strategic Action Plan (RSAP) which prioritizes infrastructure development and water management.

## 2 The Project

### 2.1 Outcomes and impacts

25. The project's immediate outcomes are the promotion of innovative and alternative approaches to sanitation based on the development of an ICSMP and the consequent ability of the Seychelles Government to mobilise funds for sanitation projects. Thus, the project will be the base for the realisation of highly innovative sanitation solutions with multi-sectoral benefits, which will have two main long-term impacts: The improvement of the Seychelles Environment and the improvement of health and sanitary conditions at the targeted islands.

### 2.2 Outputs

26. There will be three main outputs of the project:

- i. Main stakeholders – PUC and concerned ministries, politicians – are aware of the value of an integrated, comprehensive sanitation planning approach,
- ii. Government, PUC and stakeholders approve an integrated comprehensive sanitation master plan and
- iii. Cost effective projects are identified for submission to various funding agencies

### 2.3 Activities

27. Project activities are grouped in two project components,

- i. Component 1 Integrated Comprehensive Sanitation Master Plan
- ii. Component 2 Consultation and Project Management

#### 2.3.1 Component 1: Integrated and Comprehensive Sanitation Master Plan

28. The project defines sanitation as management of sewage and faecal sludge. A sanitation system is a set of technologies and/or processes working together, forming sanitation service chains or combinations thereof.

29. As mentioned above in section 1.3, the tight linkages between sanitation, water supply, energy, wastewater and stormwater make it necessary to adopt an approach which integrates sanitation planning with these closely linked sectors, within the general framework of urban planning. This approach should however also recognize existing planning documents and projects, such as the water supply master plan, or the waste-to-energy initiative. A full-fledged Integrated Urban Water Management approach would induce duplication of these reflections and is not justified. Regarding stormwater management, for which there is currently no planning document, as sewer systems are separate, connections with sanitation infrastructure is limited. Fully considering this theme as part of the sanitation master plan would most probably double the project budget due to relief complexity and high precipitations in highlands, which would go beyond the capacities of the AWF.

30. The project will therefore focus on the sanitation systems and ensure optimization of the links with other sectors through an integrated approach. In particular, the project will optimize the connections with:

- Water supply by considering the impact of (i) using reclaimed water for potable water supply, irrigation, process water in households (toilet flushing) or for industrial use and groundwater recharge, and (ii) developing demand side measures, conservation measures, and rainwater harvesting (roofs).

- Energy supply and solid waste by (i) maximizing synergies with the planned waste to energy initiative (renewable energy potential of wastewater and sludge), (ii) evaluating existing and planned sanitation systems' energy demand and (iii) assessing effects of water reuse on the water supply systems' energy demand.
- Stormwater management through (i) assessing the impact of floods on the sanitation infrastructure and (ii) analyzing the interest of promoting rainwater harvesting measures and groundwater recharge.

31. Land use planning and climate change will be considered as relevant framework conditions for the Master Plan.

32. The employment of participatory methods to ensure ownership and support for the proposed innovative solutions will lie at the heart of the project.

33. The development of the Seychelles ICSMP will follow a planning process as shown in Figure 3 below.

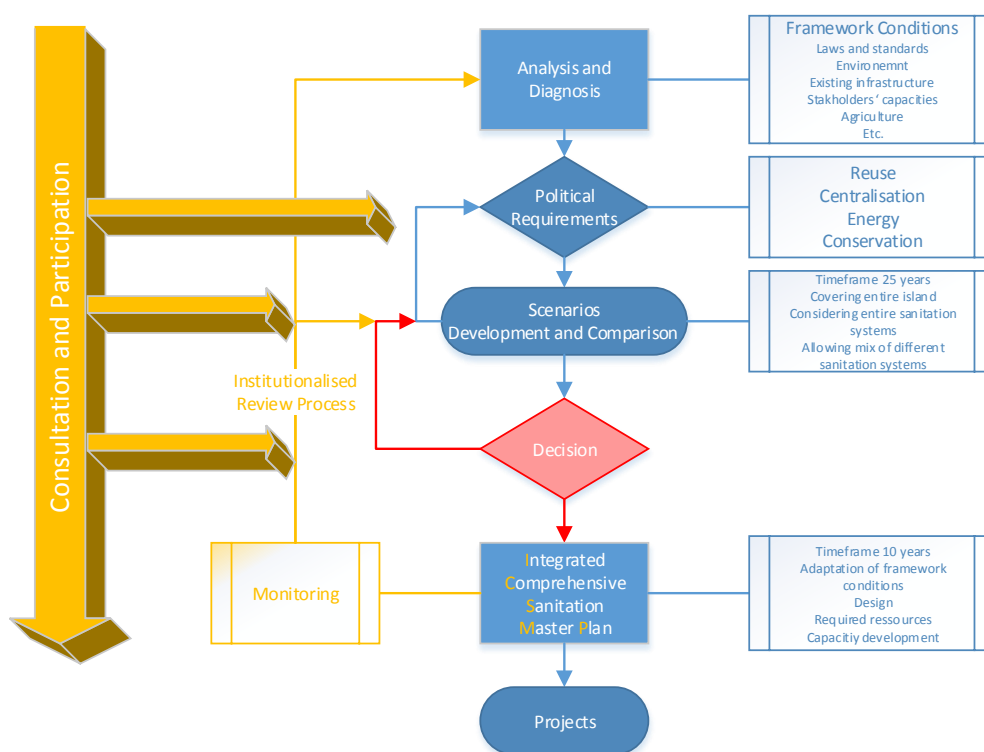


Figure 3: Sanitation planning process

34. While the main process will follow a linear logic – from analysis and diagnosis of existing framework conditions, to the development and evaluation of long-term scenarios, to ultimately a medium term Master Plan – a number of iterative steps are necessary:

- A number of scenarios will be developed and will range from traditional approaches (comparator) to highly innovative approaches and technology options.
- After the presentation of the first set of scenarios, the Steering Committee may request adjustments or merging two scenarios in a final 'Master Scenario' which will further be developed in a master plan.

35. In addition, the Master Plan should recognize that environmental, technical and economic conditions in the coming years might significantly differ from the current forecasts:

consequently, it should be easily adjustable by PUC after the end of the study. The consultant will therefore develop tools that will be handed over to PUC, and for which PUC staff will receive training, in order to allow the institution to adapt the master plan to new conditions.

#### *2.3.1.1 Phase 1 – Diagnosis*

36. A comprehensive and integrated diagnosis of the sanitation sector will be prepared including its linkages with water supply, stormwater management, waste management, energy, agriculture and land use planning. It will give a clear picture of the current situation, and identify strengths, weaknesses, opportunities and risks of the sector, for each of the themes listed below.

37. This first phase of the assignment aims at providing comprehensive input for the development of sanitation scenarios in the next phase. For the sake of an integrated approach, this analysis and diagnosis of the basic framework will not only cover existing sanitation technologies, systems and infrastructure, but also other relevant aspects like:

- water resources
- water quality
- the water supply systems
- climate change
- public health
- solid waste
- energy and electricity
- stormwater management
- commerce and industry
- environmentally sensitive areas
- hydrogeology and geology
- institutional and legal framework
- socio-economy (capacity to pay)
- tariffs and tariff structure
- agriculture
- land use and urban planning

38. Investigations in this phase will be based on existing information as well as newly developed information, mainly concerning the existing sanitation infrastructure, existing experience with alternative sanitation technologies, socio-economic conditions as well as water resources quality as a baseline (surveys). The socio-economic survey will also assess the existing on-site sanitation systems, in particular with regard to their performance, maintenance costs for the households and risks for environmental pollution.

39. In addition, current IUWM related experiences will be assessed - existing closed loop systems (hotels mainly) that use reclaimed water and sludge for landscaping or golf courses mainly, as well as rainwater harvesting initiatives promoted in the country. This assessment will be aimed at identifying promising initiatives that could be up-scaled up. These experiences will be assessed from a financial, economic, environmental, public health, water saving and socio-economic perspective.

40. Results of this phase will be presented as much as possible in maps based on and integrated in existing GIS systems.

#### *2.3.1.2 Phase 2 - Scenarios Comparison*

41. The strategic planning phase is aimed at supporting the development of vision and strategy for the Seychelles through comparing options and scenarios for a 25 year planning horizon in a comprehensive manner.

##### *2.3.1.2.1 Technology Options*



42. In a first step the range of applicable, possible technical options beyond what is currently used needs to be re-defined and compared, including technical options at all levels, from wastewater generation to transport and to treatment for further reuse or disposal. Technologies supporting use of reclaimed water and reuse of sludge at the source will be included (see annex 0).

#### 2.3.1.2.2 Scenario Development

43. In the following, different scenarios will be developed which will range from traditional approaches (so as to have a 'comparator' scenario – the value of the integrated approach can best be shown in comparison) to highly innovative approaches and technology options. Scenario development will also be based on stakeholder participation by a number of public meetings and meetings of the consultative committee (cf section 3.2.3).

44. The scenarios may consider:

- Different degrees of centralization/decentralization,
- Use of reclaimed water as process water, for irrigation, for groundwater recharge, but also for drinking water,
- Direct (agriculture, landscaping) or indirect (energy generation) reuse of sludge (separately and jointly with other organic wastes),
- Use of rainwater harvesting and groundwater recharge,
- Split flow treatment, treatment at source aimed at reusing grey waters,
- Demand side measures,
- Measures to minimise the energy demand of sanitation systems,

within the framework conditions of existing proposed land use, environmental conditions and predicted developments (climate change).

45. Scenario development should not be hindered by the current regulatory framework and current practices; scenarios may utilise technology options, which the current regulatory framework has not considered and for which it may therefore be inhibiting. Also proposed technology options' performance may deviate from currently valid standards. In these cases, the scenarios will highlight and justify required measures to create a supportive environment for these technologies (e.g. amendment of standards). Scenarios will consider planned developments in other sectors, e.g. tourism, industry, agriculture, land use, water supply, solid waste, as well as their impact on these sectors.

46. The strategic approach requires that for each scenario in addition to the targeted "end state" also the way to achieve the target and the consecutive steps along this way be described. These steps will go beyond implementation of hardware and include "soft" measures, which will be required to achieve the target. Soft measures may range from awareness creation and marketing to changing the legal framework. The institutional framework required to implement the scenario will also be proposed.

47. The impact of each scenario on the investments programmed by the Water Supply Master Plan will be detailed, since conservation measures and wastewater reuse may significantly reduce the need to mobilise additional water resources in the coming decades. The scenarios will be prepared for a number of logically definable areas, typically an entire island.

#### 2.3.1.2.3 Scenario Evaluation

48. Criteria for the evaluation of scenarios may include:

##### **Financial assessment**

- Cost (actual cash value method; parameters (interest rate, lifespan of investment, O&M cost, reuse profit, period of consideration, etc.) To be agreed with PUC; in case of differing lifespans, residual values at the end of the period of consideration will be included.).
- Minimum tariff to cover O&M cost, for full system cost recovery; tariff structure considering capacities to pay,
- Energy/electricity demand.

##### **Economic assessment**

49. The economic assessment should assess all secondary benefits linked to the protection of environment and the reuse of wastewater and sludge. All cost and benefits will be assessed in economic prices. It will in particular encompass the evaluation of the benefits related to the reduction of the Water Supply Master Plan investments thanks to waste water reuse or conservation measures.

50. In particular, investments and measures related to conservation, rainwater harvesting, wastewater reuse, sludge recycling shall be assessed in detail to analyse their relevance at the national level: these measures might not show a financial interest, but may make sense economically at the national level. Based on this analysis, proposal of compensation measures for PUC or households (such as subsidies) will be proposed.

##### **Environmental and socio-economic assessment**

51. The environmental impacts of each scenario shall be broadly assessed. The assessment criteria will include:

- Impact on ecosystems and water quality,
- Socio economic impacts, including possible households' relocation and financial impacts on households' budgets.

##### **Climate Change assessment**

52. The carbon footprint of each scenario (construction, operation and maintenance) will be estimated and their degree of resilience to climate change effects compared.

53. Based on the outcome of the scenario development and comparison step, an informed decision for a “Master-Scenario” will be taken by the Steering Committee, which will then be developed into a Master Plan. Due to the nature of the integrated approach, the Sanitation Master Plan will have an influence on, and be influenced by plans in other sectors and this will have to be taken into account accordingly.

54. The flexibility of the planning approach as well as its effectiveness will be enhanced by an institutionalized monitoring system, with a continuous feedback into a regular review process.

#### *2.3.1.3 Phase 3 – Master Plan*

55. Based on the “Master Scenario” developed and agreed upon in phase 2 an Integrated Comprehensive Sanitation Master Plan for a planning period of 10 years will be prepared. Investments and accompanying measures shall be prioritized for a 10-year planning period.

##### *2.3.1.3.1 Preliminary design*

56. For these prioritized investments, preliminary design documents will be prepared and form the base for the cost estimate. The preliminary design is meant to bridge the gap between the strategic orientations (Master Scenario) and the detailed design phase. While during detailed design and optimization, the parameters of the parts being designed may change, the preliminary design focuses on creating the general framework and ensuring consistency between the various investment phases.

##### *2.3.1.3.2 Economic and financial analysis*

57. Refining the assessment undertaken for the comparison of scenarios the economic analysis of the ICSMP shall be prepared, including direct and indirect costs and benefits for all concerned sectors (e.g. including reduced cost for desalination due to reuse of wastewater, increased agricultural yield due to reuse of nutrients).

58. A financial analysis will also be carried out. It will take into account the existing financial model of PUC, which covers water, sanitation and electricity. Electricity revenues are currently subsidizing the sanitation sector, and the financial impact of the master plan on PUC will be looked at comprehensively. The analyses will include 2 to 3 scenarios, based on tariff assumptions. These assumptions will be based on a comprehensive tariff analysis supported by the results of a socio-economic survey and proposing alternative structured tariff options for O&M cost recovery / full cost recovery including incentives for demand side management. Each scenario will assess the external financing needs for PUC, based on a ten year implementation plan of the investments.

59. The financial analysis will also address:

- The impact of the measures proposed at the household level (on the household budget): rainwater harvesting, separation at the source, rehabilitation of septic tanks, etc.
- The financial impact of waste water reuse measures for economic actors: farmers, industries, Hotels.

#### 2.3.1.3.3 Sequencing

60. Prioritised investments will then be arranged in logical sequences (projects), optimizing the utilisation of available (financial) resources and utilizing synergies (e.g. with other sector's activities and plans) as much as possible. The result will be an investment plan for a 10-year period, based on an integrated comprehensive approach and taking priorities and actual capacities for implementation into account.

#### 2.3.1.3.4 Accompanying measures – awareness, behaviour change, capacities

61. This 10-year Master Plan may be based on a number of conditions and assumptions, which have to be met in order to guarantee its successful realisation. Therefore a number of accompanying measures, ranging from capacity building of relevant stakeholders (e.g. PUC O&M capacities), to awareness creation and behaviour change activities (e.g. policy awareness, demand creation measures, reuse) shall be planned for. This plan of "soft" activities shall clearly show the perceived deficit, target group, activities, costs and timing within the 10-year plan.

### **2.3.2 Component 2: Project Management, Consultation and Communication**

62. Project Component 2 comprises project management, consultation and Technical Assistance (TA) activities and aims at an effective and efficient implementation of the project and the achievement of the project outputs with the planned resources.

#### *2.3.2.1 Project Management*

63. PUC will nominate a project management team (see profiles in 3.2.2.1 below). The project coordinator will coordinate the project, manage the internal and external communication flow, and prepare reporting documents for the Steering Committee and AWF.

#### *2.3.2.2 Stakeholder Consultation, Community Participation*

64. A sound consultation process will be implemented to support the planning process. This consultation process will be organized at different levels:

- A consultative committee with the main stakeholders will be the main forum for discussing the results of the study in order to inform the steering committee decisions. It will be organised at the four main milestone of the projects.
- Three public meetings shall be organized to get a direct feedback from the population.
- A simple website will also provide information on the project for the citizens.

#### *2.3.2.3 Donors Mobilisation*

65. In order to achieve outcome 1, potential donors will be involved in the project as early as possible by sharing project progress and interim results bilaterally and by an organized

mission to Mauritius to meet donor's representatives. A final donor's conference will be organized at the end of the project.

#### 2.3.2.4 Technical Assistance

66. IUWM is a concept, which is rarely used by Consultants, and there are very few companies with significant references in this field. Therefore, PUC and the Consultant for Project Component 1 need to be supported by a Technical Assistance (TA) with the following responsibilities:

##### Awareness creation

- Integrated Urban Water Management (for PUC, steering and consultative committee, politicians)
- Innovative, alternative sanitation technologies (PUC, consultant)

##### Capacity Building

- Strategic planning
- Capacities of PUC to periodically update the planning process (methodology, alternative sanitation technologies, alternative technologies with cross-sectoral impact (reuse, energy, etc.), hydraulic modelling)

##### Support Master Plan consultancy services supervision

- Support to steering committee to keep project on track
- Support to PMU to review deliverables
- Support to PMU and consultant to focus on integrated approach and consider all possible options / scenarios

##### Capacity needs assessment

- identify capacity building needs

67. Furthermore, a study trip for PUC and the agencies in charge of wastewater and stormwater will also be organized in a country that can showcase IUWM programmes.

68. A conference on innovative technical options and integrated sanitation planning approaches will be organized after the diagnosis phase, in order to attract international specialists and identify recent innovative technologies adapted to the local context. This conference shall be organized in partnership with an international networking institution.

## 2.4 Risks and Mitigation Measures

69. Table 1 below presents the main risks and mitigation measures.

*Table 1: Main risks and mitigation measures*

<b>Risk:</b>	<b>Mitigation:</b>
Limited donors' commitment to the sewerage sector	Involve donors early in the study
Political acceptability of higher tariffs	Awareness creation activities for decision makers
Project is not able to create sufficient	Support by TA and accompanying activities (e.g.

awareness for innovative approaches	conference on innovative technologies and approaches)
Consultants may not deliver reports of adequate quality	Support by TA
Lack of acceptance of innovative technologies, systems by stakeholders	Awareness creation activities, study tour, conference on innovative technologies and solutions, consultative committee meetings, public meetings

## 2.5 Costs and Financing

70. The project cost amounts EUR 1,439,655 of which EUR 1,073,100 (75%) will be funded by AWF, EUR 366,555 (25%) by PUC. Annex 0 provides a detailed cost estimate. Table 2 shows the cost estimate by component while table 3 presents the cost estimate by category.

*Table 2: Project Cost Estimate by Component and Funding Source (EUR)*

Project Components	Cost	AWF	PUC
<b>Component 1 - ICSMP</b>	<b>946,000</b>	<b>919,000</b>	<b>27,000</b>
<b>Component 2 - Project Management</b>	<b>425,100</b>	<b>103,000</b>	<b>322,100</b>
Project Management	120,000		120,000
Consultation and communication	142,500	103,000	39,500
Technical Assistance	92,000		92,000
Equipment	70,600		70,600
<b>Unforeseen</b>	<b>68,555</b>	<b>51,100</b>	<b>17,455</b>
<b>Total Cost</b>	<b>1,439,655</b>	<b>1,073,100</b>	<b>366,555</b>

*Table 3: Project Cost Estimate by Categories (EUR)*

Category/ Item	Amount	Funded by
<b>Goods</b>	<b>70,600</b>	
Equipment	70,600	PUC
<b>Services</b>	<b>1,180,500</b>	
Consultancy Services main study	919,000	AWF
Water quality analysis	27,000	PUC
Awareness building and Technical Assistance	92,000	PUC
Public meetings	4,500	PUC
Steering (5) and Consultative (3) Committee meetings	8,000	PUC
Conference: integrated planning and alternative technologies		
Organisation	103,000	AWF
Hosting and speakers costs	13,000	PUC
Donor's conference	4,000	PUC
Web-site	10,000	PUC
<b>Operating Cost</b>	<b>120,000</b>	
Project Management Unit (in kind)	120,000	PUC in kind
<b>Contingencies</b>	<b>68,555</b>	<b>AWF/PUC</b>
<b>Total</b>	<b>1,439,655</b>	

### 3 Project Implementation

#### 3.1 Recipient and Implementing Agency

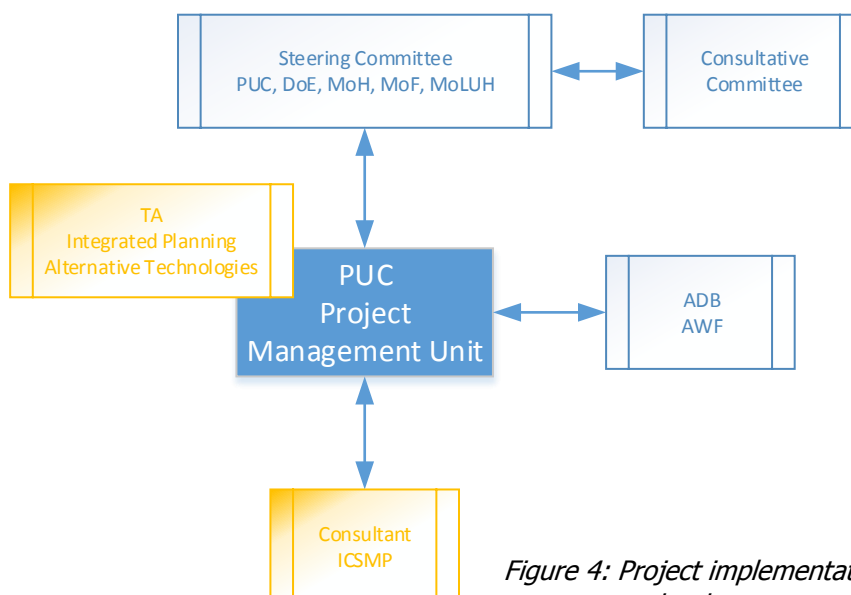
71. The Recipient of the AWF grant for the studies will be the Government of Seychelles and the Public Utilities Corporation will be the Implementing Agency.

72. PUC was established by the Public Utilities Corporation Act 1986 for the supply of electricity and water and the provision of sewerage services. PUC has already demonstrated good technical capacity to handle large ADB/AWF funded studies in recent years (Water Supply Master Plan and Design of the La Gogue Dam), and has a Department dedicated to Project Management, the Project Management Unit, which has successfully managed various donors funded investments amounting € 34 million since 2011.

#### 3.2 Implementation Arrangements

##### 3.2.1 Structure

73. The project will be implemented by PUC / PMU (Project Management Unit) with the support of a TA (Technical Assistance). The TA will support PUC and the Consultant for project component 1 with regard to integrated sanitation planning approaches and methodologies and innovative, alternative technologies.



*Figure 4: Project implementation structure*



### **3.2.2 Project Steering and Monitoring Arrangements**

#### *3.2.2.1 Project Management Unit*

74. PUC has a permanent project management unit which will also be responsible for the management of this project.

75. The Project Management Unit (PMU), which is a permanent PUC department, is headed by a Project Director, who reports to the Deputy Chief Executive Officer (Head of Planning & Business Development). The Project Director is assisted by a co-ordinator for planning & monitoring of project activities. The PMU is mandated to handle all capital investment on behalf of the organisation.

76. For this project PUC will nominate a dedicated project team within the PMU composed of a Project Coordinator and its deputy, accountant, procurement specialist and communication specialist acceptable to the Bank.

#### *3.2.2.2 Steering Committee*

77. A steering committee composed of the main entities/ministries concerned: Public Utilities Corporations, Ministry of Environment, Ministry of Health, Ministry of Finance, Ministry of Land use and Housing, Landscape and Waste Management Agency and any other relevant public institution.

78. The steering committee will provide guidance all along the planning process and validate the main outputs of the study.

79. The steering committee will be the main decision making body for the project. Furthermore, it will be the steering committee's responsibility to ensure that all milestone dates are and responsibilities adhered to throughout the project.

#### *3.2.2.3 Project monitoring process*

80. Project progress monitoring will be based on a continuous informal information flow between the consultant and PUC but also on formal regular monthly project meetings, which will be called and organised by PUC.

### **3.2.3 Consultative Meetings and Workshops**

81. Sanitation is a sensitive issue, and a sound consultation process will be implemented to support the development of a Master Plan. This consultation process will be led by PUC with the support of the consultant and be organized at two levels:

#### *3.2.3.1 Consultative committee*

82. A consultative committee with the main stakeholders will be the main forum for discussing the results of the study, in order to inform on and guide steering committee decisions.

#### *3.2.3.2 Public meetings*

83. Furthermore, a number of public meetings will be organized to obtain a direct feed-back from the population.

### **3.3 Financial Management and Auditing**

84. PUC will be responsible for the financial management (FM) of the project. Its Finance Departments has ten staffs, including a Financial Controller and is headed by a Chief Financial Officer (CFO) with 15 years of experience. A project Accountant, reporting to the Director of the Project Management Unit and controlled by the Finance Department, will be in charge of establishing the project accounts. PUC also has an Internal Auditor directly reporting to the Board of Directors. PUC uses the ANAEL software and will migrate to the Enterprise Resource Planning Software which can produce project accounting statements.

85. PUC completed in 2011 an AWF project, the Seychelles Water Supply Master Plan, and the auditor's opinion was unqualified. Since the year 2011, three international donors funded projects amounting €34 million were completed. PUC has proven financial management procedures and adequate experience in managing international donors financing, acquired through the successful implementation of AfDB's, EIB's and AFD's projects. The corporation is audited annually by the General Auditor of the Seychelles, and the 2013 audit considered that the financial statements 'fairly represent the state of affairs of the Corporation' and 'have been prepared in accordance with the requirements of the PUC Act'.

86. The project accountant will maintain an accounting system and books of account specifically for the project. The accountant will maintain the accounts and prepare periodic financial statements in accordance with AWF/AfDB procedures. These statements will be submitted to AWF together with the quarterly progress reports.

87. AWF will recruit and retain an independent auditor to perform a final audit of the financial statements and ex-post procurement review of the contracts financed by AWF funding. AWF will cover the audit costs which will not be deducted from the Grant.

### 3.4 Procurement Arrangements

88. All procurement arrangements of this project will be in accordance with Bank's procurement rules and Procedures as modified by AWF Operational Procedures. The use of relevant Bank Standard Bidding documents is mandatory. Procurement arrangements are summarized in table 4 and described below.

*Table 4: Procurement arrangements (EUR)*

	AWF funded €		PUC funded €	Total €
	QCBS	NCB	PUC procedures	
<b>Consultancy Services</b>				
Consultancy Services main study	919,000			919,000
Awareness building and Technical Assistance			92,000	92,000
<b>Other Services</b>				
Water quality analysis			27,000	27,000
Conference: integrated planning and alternative technologies				
Organisation		103,000		103,000
Hosting and speakers costs			13,000	13,000
Donor's conference			4,000	4,000
Public meetings			4,500	4,500
Steering (5) and Consultative (3) Committee meetings			8,000	8,000
Web-site			10,000	10,000

Project Management Unit (in kind)			120,000	120,000
Goods				
<b>Equipment</b>			<b>70,600</b>	<b>70,600</b>
Contingencies	51,100		17,455	68,555
<b>TOTAL</b>	<b>970,100</b>	<b>103,000</b>	<b>366,555</b>	<b>1,439,655</b>

89. In order to meet the schedule of the project, the PUC intends to request for the use of advance procurement for the AWF supported consultancy contract.

90. The AWF will finance a single consultancy contract amounting to EUR 919,000. This acquisition of consultancy services will be carried out through shortlisting and the quality and cost based selection (QCBS) in compliance with the Bank's "Rules and Procedures for using Consultants".

91. For contract amounts valued at less than UA 200,000 the Borrower may limit advertisement for the procurement to national or regional newspapers. However, any eligible consultant, regional or not, who wishes to provide the requested services, may express his/her desire to be short-listed. For contract amounts valued at more than UA 200,000 for consultancy services, advertisement for the procurement must be placed in the UN Development Business Journal and the Bank's website. For individual consultants, the selection method shall be through the Bank's procedure for the selection of individual consultants.

92. Project management, consultation and communication, technical assistance, conference costs and equipment amounting to EUR 273,100 will be financed entirely by PUC and procured according to the national rules.

93. Assessment of the capacity of the Executing Agency: PUC procurement department staffed with 10 experienced Procurement Officers, and the head of the department has 10 years of experience in procurement. An Internal Auditor who reports directly to the Board is in charge of auditing the procurement processes. As presented in section 3.3, PUC has managed since 2011 for about EUR 34 million of International Donors funded project. In particular, since 2008, PUC has successfully procured two ADB/AWF funded studies of a similar amount: the Water Supply Master Plan (AWF) and the design of the Raising of La Gogue Dam (MIC Grant). The final post-procurement audit (KPMG, 2012) of the AWF funded project concludes: 'the procedures on procurement were observed to be transparent and the selection process carried out by the evaluation committee on behalf of the steering committee were professional and well guided through approvals from the Bank'. The procurement capacities of PUC are consequently assessed satisfactory.

94. General Procurement Notice: The text of a General Procurement Notice (GPN) and a Request for Expression of Interest (REI) will be submitted to the Bank for reviewed and issued for publication in UN Development Business online, on the Bank's web site, and on national newspapers upon approval of the project.

95. Procurement plan: The Executing Agency shall prepare and submit to the Bank a Procurement Plan covering the whole project duration. The Grant Recipient will update the Procurement Plan on an annual basis or as needed always covering the next 18 months period of project implementation. Any revisions proposed to the Procurement Plan will be submitted to the AfDB's prior no objection. The Grant Recipient shall implement the Procurement Plan in the manner in which it has been agreed with the Bank.

96. Prior Review: The following documents are subject to review and approval by the Bank before promulgation: (i) Terms of References for all consultancy assignments, whether financed by the AWF or PUC, are subject to prior review by the Bank; (ii) Specific

Procurement Notices or Requests for Expression of Interest, (iii) Tender Documents or Requests for Proposals from Consultants, (iv) the technical evaluation report; (v) Tender Evaluation Reports or Final Reports on Evaluation of Consultants' Proposals, including recommendations for Contract Award, and (iv) Draft contracts, if these have been amended from the drafts included in the tender invitation documents.

### 3.5 Disbursement terms and conditions

97. The disbursement method for AWF financed contract will be the Direct Payment to the consulting firms recruited for the implementation of the studies, in accordance with the terms of the contract signed with the firm.

98. The first disbursement of the Grant will be conditioned to the satisfaction of the following conditions:

- Provision of a letter from the Ministry of Finance Confirming PUC's contribution;
- Nomination of the members of the project team that should include a project coordinator and deputy, accountant, procurement specialist and communication specialist acceptable to the Bank.

### 3.6 Implementation Schedule and performance management plan

99. The duration of the project is estimated to 24 months. This includes 8 months for procurement of services and equipment and 14 months for the development of the ICSMP, as shown in Table 5.

Table 5: Indicative implementation schedule

	M-8	M-7	M-6	M-5	M-4	M-3	M-2	M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16
<b>Component 1 - ICSMP</b>																								
Project Approval																								
Signing of Grant Agreement																								
Advance procurement																								
Phase 1 - baseline and analysis																								
Phase 2 - scenarios																								
Scenarios 1st draft																								
Steering Committee approval																								
Scenario Development 1																								
Steering Committee review and recommendations																								
Scenario Development 2																								
Decision Master-Scenario																								
Phase 3 - master plan																								
Master Plan Draft																								
Steering Committee review and recommendations																								
Master Plan Finalisation																								
<b>Component 2 - PM</b>																								
Procurement of equipment																								
Procurement and Mobilisation TA																								
TA																								
Project Management																								
Project Closure																								

100. The purpose of the project management is the optimum implementation of project processes with limited resources (time, budget, personnel). Project performance will be

monitored based on milestones (see Table 6) as well as the logical framework matrix for results based monitoring.

*Table 6: Project timeframe and main milestones*

	M-8	M-7	M-6	M-5	M-4	M-3	M-2	M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16
Milestones																								
Project approval T0		★																						
Signing of grant agreement T0 + 3					★																			
Subcontracting of services T0 + 8								★																
Baseline data report T0 + 11											★													
Draft scenarios T0 + 12												★												
Master Scenario T0 + 16																	★							
Master Plan T0 + 22																						★		
Project completion report T0 + 24																								★

### 3.7 Monitoring and Reporting Arrangements

101. The Implementing Agency shall be responsible for the day to day supervision of the consultancy services and for liaising with the Consultants to ensure timely production and delivery of the outputs of the study. The Logical Framework matrix shall serve as an overall basis for the result based assessment of the outputs of the project during implementation and after completion.

102. The Project Coordinator will collaborate with the AWF Task Manager during project implementation to discuss matters arising and ensure rapid processing of necessary formalities, e.g. issuing of non-objection, etc. The AWF will also monitor project implementation, as well as review the progress reports. In addition, the AWF may undertake field supervision missions as the need to do so arises.

103. The Steering Committee shall ensure that the project remains on track as far as the project outputs are concerned. It shall approve relevant reports and deliverables before proceeding with further project activities.

104. The Implementing Agency shall submit quarterly progress reports to the AWF that clearly indicates the level of attainment of results and addresses any discrepancies from the set targets. The Implementing Agency shall also prepare and submit a project completion report attesting the completion of the study and showing lessons learnt from the implementation.

### 3.8 Visibility

105. The AWF has established Communication and Visibility Guidelines to the attention of grant recipients (attached to this document as annex 0). The PMU will apply these AWF Communication and Visibility Guidelines.

## 4 Effectiveness, efficiency, viability, and sustainability

#### **4.1 Effectiveness and Efficiency**

106. The project will be effective by the utilisation of an integrated planning approach for the development of the Master Plan. By considering a wide range of evaluation criteria for the best sanitation scenario the resulting investment projects will be beneficial beyond the sanitation sector and therefore be supported by all relevant stakeholders and highly attractive for financing. The proposed comprehensive and integrated planning approach will ensure the efficiency of sanitation investments by prioritizing activities with the widest impact at lowest cost.

#### **4.2 Viability**

107. Project viability is at risk if the proposed innovative integrated and comprehensive approach cannot be realised due to the consultant's lack of knowledge and experience or relevant stakeholders' lack of understanding. Project viability will be assured by appropriate awareness creation activities and the provision of suitable technical assistance, providing the required expertise with regard to an integrated sanitation planning process and innovative technological options.

108. Financial viability of the planned sanitation interventions will be assured by an appropriate financial and economic assessment of the scenarios and the master plan. PUC will actively seek for donors' mobilisation through an early engagement with potential financiers and the organisation of a donors' conference at the end of the project.

#### **4.3 Sustainability**

109. The proposed integrated and comprehensive planning approach aims at developing sustainable sanitation solutions. The entire concept of IUWM pursues sustainable development goals.

### **5 Conclusions and Recommendations**

#### **5.1 Conclusion**

110. The proposed project is consistent with related national strategies in the Seychelles. The project will allow PUC to prioritize investments in sanitation infrastructure in a way which does not only contribute to the elimination of current sanitation problems but benefits other sectors through:

- Minimizing fresh water demand by using reclaimed water,
- Increasing agricultural productivity by providing reclaimed water for irrigation and treated organic wastes for fertilization and soil improvement,
- Securing tourism development by improving surface water quality,
- Reducing greenhouse gas emissions by optimizing sanitation infrastructure energy demand and generating renewable energy from wastes, and generally
- Integrating the sanitation master planning process with other relevant sectors.

111.The proposed project's outputs will allow PUC to attract funds for sustainable infrastructure investments, which will ultimately help to achieve the projects impact.

112.The funding of this project is also consistent with the AWF 2012-2016 strategy whose first priority is the preparation of bankable infrastructure projects as well as with the Bank's 2013-2022 strategy which promotes green and inclusive growth.

113.The total project duration is 24 months. The project is estimated to cost EUR 1,439,655 to be funded by an expected AWF grant of EUR 1,073,100 and a PUC contribution of EUR 366,550.

## **5.2 Recommendations**

114.Based upon a critical assessment of the relevance, effectiveness, and sustainability of the Project, as well as the credibility and capacity of the Implementing Agency, it is recommended that a grant of EUR 1,073,100 (75%) out of a total cost estimate of EUR 1,439,655, from the AWF be extended to the Republic of the Seychelles for the implementation of the project described in this appraisal report. The conditions precedent to first disbursement will be:

- Provision of a letter from the Ministry of Finance confirming PUC's monetary and in kind contribution;
- Nomination of the members of the project team that should include a project coordinator and deputy, accountant, procurement specialist and communication specialist acceptable to the Bank.

# Annexes

## Annex 1: Cost estimate

Item	Unit	Quantity	Rate	Cost	AWF	PUC
<b>Component 1: main study</b>						
<i>Manpower</i>						
Team Leader	Month	6	18,000	108,000	108,000	
Sanitation Expert International	Month	2	16,000	32,000	32,000	
Sanitation Expert Regional	Month	6	8,000	44,000	44,000	
Water Supply Expert	Month	3	8,000	20,000	20,000	
Hydrogeologist	Month	2	8,000	16,000	16,000	
Agronomist reuse	Month	1	16,000	16,000	16,000	
Financial expert (tariff, PUC financial model)	Month	5	16,000	72,000	72,000	
Environmental Expert	Month	3	8,000	24,000	24,000	
Solid Waste Expert	Month	2	16,000	32,000	32,000	
Socio-economist	Month	4	8,000	32,000	32,000	
Economist	Month	2	16,000	32,000	32,000	
International technician / designer	Month	6	10,000	60,000	60,000	
Regional technician / designer	Month	9	4,000	36,000	36,000	
<i>Sub-total</i>		50		524,000	524,000	
<i>Other costs</i>						



Item	Unit	Quantity	Rate	Cost	AWF	PUC
International travels	Unit	15	2,000	30,000	30,000	
Regional travels	Unit	10	400	4,000	4,000	
Car rental	day	150	40	6,000	6,000	
Per Diem	day	325	200	65,000	65,000	
Sewerage inspection (camera, pressure testing, survey)	m	60,000	4	240,000	240,000	
Investigations (topography / geotechnics) for strategic plan and masterplan	Lumpsum			50,000	50,000	
water quality monitoring (30 locations, 3 samples/location)	samples	90	300	27,000		27,000
<i>Sub-total</i>				<i>422,000</i>	<i>395,000</i>	<i>27,000</i>
<b>Consultancy Services main study</b>				<b>946,000</b>	<b>919,000</b>	<b>27,000</b>
<b>Component 2: project Management</b>						
<i>Project Management Unit (in kind)</i>	Month	15	8,000	120,000		120,000
<i>Awareness building and Technical Assistance</i>						
IUWM expert	Month	2	17,000	34,000		34,000
Waste to energy expert, Sanitation Expert	Month	2	17,000	34,000		34,000
International travels	Unit	6	2,000	12,000		12,000
Per Diem	day	60	200	12,000		12,000
<i>Sub-total awareness building and TA</i>				<i>92,000</i>		<i>92,000</i>
<i>Consultation and communication</i>						
Web-site	Lumpsum			10,000		10,000
Public meetings	Unit	3	1,500	4,500		4,500
Steering (5) and Consultative (3) Committee meetings	Unit	8	1,000	8,000		8,000
Conference: integrated planning and alternative technologies	Lumpsum	1	120,000	120,000	103,000	13,000
Donor's conference	Lumpsum	1	4,000			4,000

Item	Unit	Quantity	Rate	Cost	AWF	PUC
<i>Sub-total Consultation and Communication</i>				142,500	103,000	39,500
<i>Equipment</i>						
Sewer camera for pipe inspection	Unit	1	25,000	25,000		25,000
Portable multigas detector (O2, H2S, CO and combustible gas)	Unit	1	2,000	2,000		2,000
Personal computer	Unit	2	1,000	2,000		2,000
Printer	Unit	1	600	600		600
Sewer modelling software	Unit	1	23,000	23,000		23,000
GIS licence	Unit	1	18,000	18,000		18,000
<i>Sub-total equipment</i>				70,600		70,600
<b>Total Project Management</b>				<b>425,100</b>	<b>103,000</b>	<b>322,100</b>
<b>Contingencies (5%)</b>				<b>68,555</b>	<b>51,100</b>	<b>17,455</b>
<b>TOTAL PROJECT COST</b>				<b>1,439,655</b>	<b>1,073,100</b>	<b>366,555</b>
					75%	25%

## Annex 2: Sanitation in the Seychelles

### MDGs

According to the last census, 100% of the houses on Mahé, Praslin and La Digue (which are home of almost 99% of the total population) were served by some form of sanitation system, meaning that Seychelles has already achieved the MDGs in terms of sanitation.

### On site sanitation

App. 85% of the entire population rely on septic tanks with soak pits to dispose their sewage. These septic tanks are constructed either for single households or for household estates. Due to soil- and hydrogeological conditions (rocky area with limited soil cover, partly high groundwater table) as well as insufficient design, these septic tanks often do not perform as planned, causing a significant risk of contamination. Septic sludge is removed with vacuum trucks by private service providers, causing high operation cost for the owners, resp. the PMC for housing estates. The sludge is transported to the Providence treatment plant.

### Water borne sanitation

Currently four centralized sewerage systems exist in the Seychelles, all located on Mahé Island, serving app. 15% of the entire population:

- Greater Victoria sewerage system (3,401 connections)
- Beau Vallon sewerage system (294 connections)
- Pointe Larue sewerage system (covering the Nageon Estate; 174 connections)
- Anse Aux Pins sewerage system (covering Chetty Flats; 44 connections).

“Sewerage areas”, which require all households in these areas to connect to the sewer line have not been formally declared. Therefore not all houses which could be connected to existing sewer lines are actually also connected.

### The condition of the existing sewer lines is mostly unknown.

Currently four wastewater treatment plants (3 activated sludge, 1 RBC) treat water from the four sewer networks described earlier. In addition, a number of hotels operate their own sewage treatment plants and some housing estates use (pilot) treatment plants.

Praslin and La Digue Islands currently do not have centralized sewerage systems; however, a proposal to implement a centralized sewerage system on La Digue in 2015 is being finalized under the EIB-AFD loan.

### Summary of possible technology options

The following non-comprehensive summary of possible technologies will be taken into consideration in the preparation of sanitation system scenarios:

At the source

Source separation: separation of wastewater streams according to pollution level and reuse potential both at household level and for industrial processes.

Split flow treatment: treatment (e.g. constructed wetlands, RBC, SBR, MBR, MBBR, etc.) of separated flows with the aim of reusing (e.g. for toilet flushing, irrigation, process water)

#### Conveyance

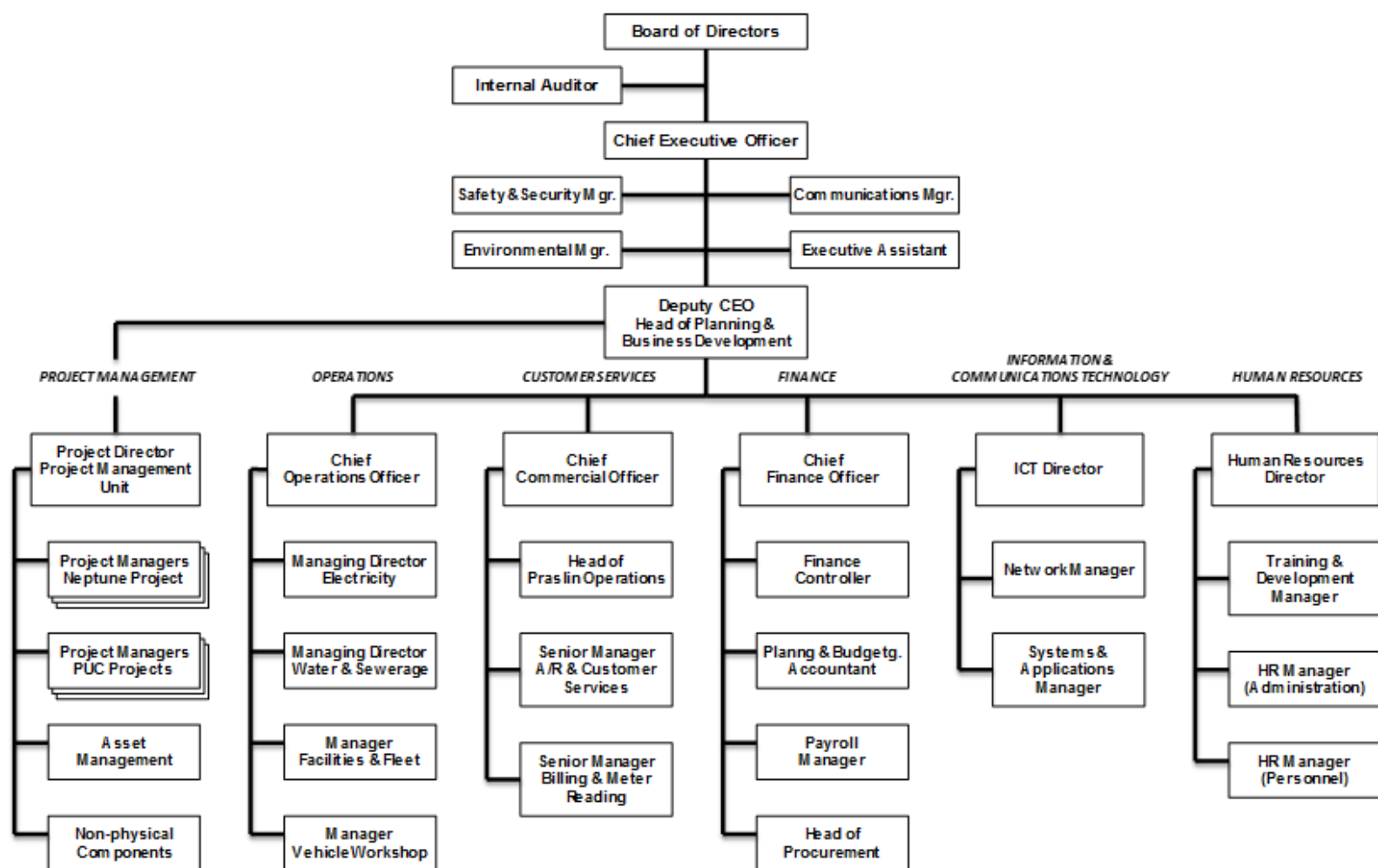
Conventional gravity sewer (simplified, solid-free sewer – not recommended), vacuum sewer, transport by tankers.

#### Treatment

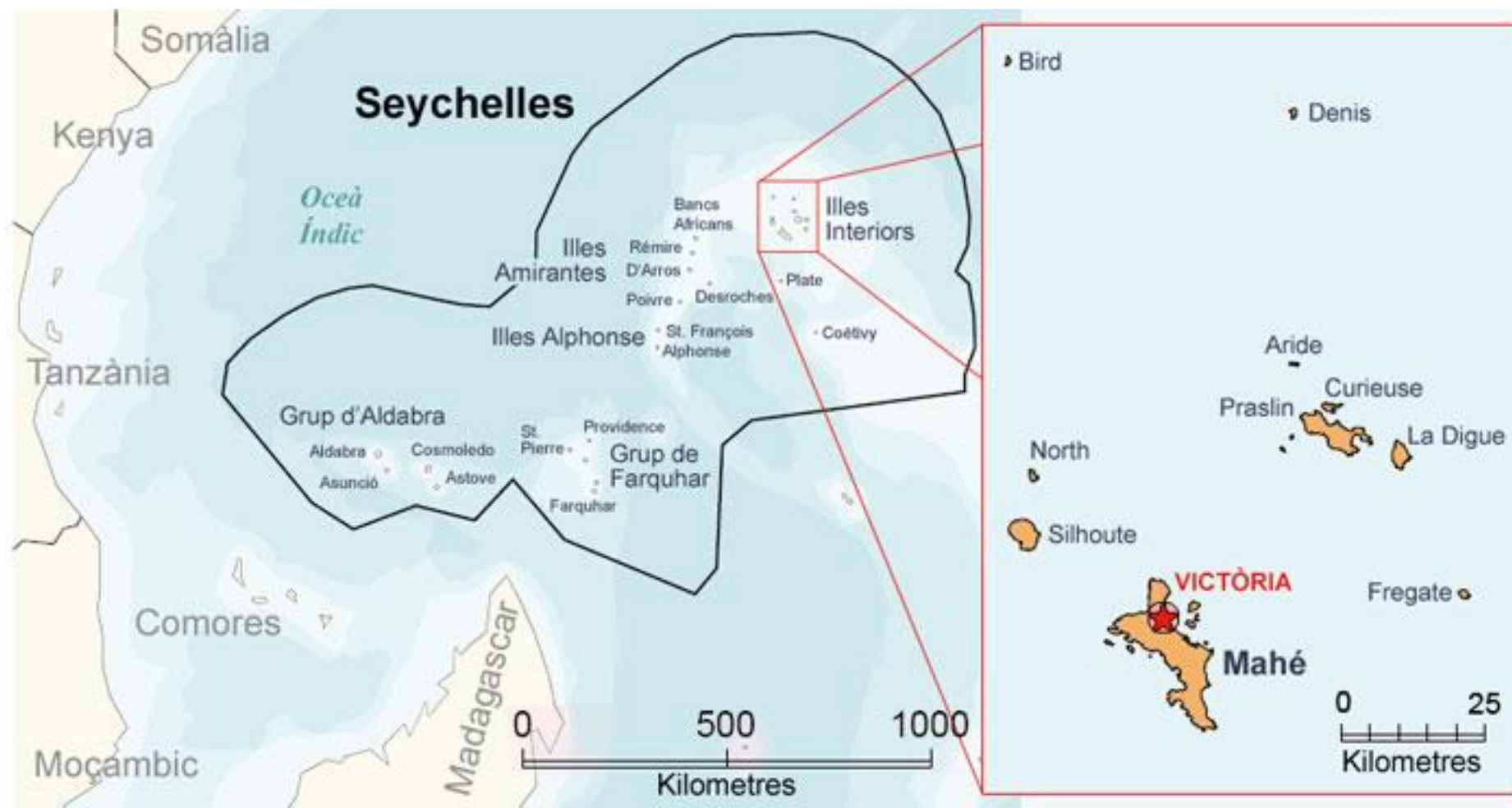
Treatment of wastewater and biosolids (faecal sludge, organic waste fraction) with the aim of reuse for different purposes, e.g. process water, irrigation, groundwater recharge, biogas generation, thermic reuse:

- water: ABR, UASB, trickling filter, RBC, activated sludge, SBR, MBR, MBBR
- biosolids: dewatering (reed beds, presses), composting, digestion (biogas-electricity), incineration (heat-electricity)

## Annex 3: PUC Organisation Chart



## Annex 4: Map



Source: wikipedia.org

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## Annex 5: Draft TOR ICSMP



# **Seychelles Integrated Comprehensive Sanitation Master Plan**

Consultancy Services

Terms of Reference

Draft

December 2014

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## **List of Acronyms**

ABR Anaerobic Baffled Reactor

AFD French Development Agency

AfDB African Development Bank

AWF African Water Facility

CCTV Closed Circuit TeleVision

DoE Department of Environment

EIB European Investment Bank

EN European Norm

ESIA Environmental and Social Impact Assessment

GIS Geographic Information Systems

HH Household

ICSMP Integrated Comprehensive Sanitation Master Plan

IUWM Integrated Urban Water Management

MBR Membrane Bio Reactor

MBBR Moving Bed Biofilm Reactor

MDG Millennium Development Goal

MoF Ministry of Finance

MoH Ministry of Health

MoLUH Ministry of Land Use and Housing

MoTC Ministry of Tourism and Culture

O&M Operation and Maintenance

PO Private Operator

PMU Project Management Unit

PUC Public Utilities Corporation

RBC Rotating Biological Contactor

SBR Sequencing Batch Reactor

SC Steering Committee

SAA Seychelles Agricultural Agency

SESA Strategic Environmental and Social Assessment

SEYFA Seychelles Farmers Association

STP Sewage Treatment Plant

TA Technical Assistance

UASB Upflow Anaerobic Sludge Blanket

WWTP Wastewater Treatment Plant

## **1 Scope of the study**

The project defines sanitation as management of sewage and faecal sludge. A sanitation system is a set of technologies and/or processes working together, forming sanitation service chains or combinations thereof.

The tight linkages between sanitation, water supply, energy, wastewater and stormwater make it necessary to adopt an approach which integrates sanitation planning with these closely linked sectors, within the general framework of urban planning. This approach should however also recognize existing planning documents and projects, such as the water supply master plan, or the waste-to-energy initiative. A full-fledged Integrated Urban Water Management approach would induce duplication of these reflections that are not justified. Regarding stormwater management (for which there is currently no planning document), sewer systems are separate and connections with sanitation limited. Fully considering this theme as part of the sanitation master plan would most probably double the project budget due to limited available information and a complex situation, which would go beyond the capacities of the AWF.

The assignment will therefore focus on the sanitation systems and ensure optimization of the links with other sectors through an integrated approach. In particular, the project will optimize the connections with:

- Water supply by considering the impact of (i) using reclaimed water for drinking water supply, irrigation, process water in households (toilet flushing) or for industrial use and groundwater recharge, and (ii) developing demand side measures, conservation measures, and rainwater harvesting (roofs).
- Energy supply and solid waste by (i) maximizing synergies with the planned waste to energy initiative (renewable energy potential of wastewater and sludge), (ii) evaluating existing and planned sanitation systems' energy demand and (iii) assessing effects of water reuse on the water supply systems' energy demand.
- Stormwater management through (i) assessing the impact of floods on the sanitation infrastructure and (ii) analyzing the interest of promoting rainwater harvesting measures and groundwater recharge.
- Agriculture by analyzing the impact of reclaimed water and recycled sludge on productivity and production costs,

Land use planning and climate change will be considered as relevant framework conditions for the Master Plan.

The geographical scope of the study is limited to the three main Islands of the archipelago - Mahé, Praslin and La Digue.

## **2 Background**

### **2.1 Introduction**

The Republic of Seychelles consists of 116 islands scattered over 1 million square kilometres of sea in the middle of the Western Indian Ocean. The Seychelles archipelago is divided into two distinct areas - the Mahé group, 43 islands in all, granitic with high hills and mountains and the outlying islands, and the coralline group numbering 73 or more for most part only a little above sea level. Mahé the most important island lies between 4 degrees south latitude and 55 degrees east longitude. It is 27 km long and 11 km wide rising abruptly from the sea to a maximum 905 meters in the mountain of Morne Seychellois. Two other islands of major importance in regard to size and population are Praslin, 33.6 km from Mahé and La Digue 48 km away.

The Seychelles population reached 87,400 at the end of 2011, out of which 86% live on Mahé and 9.5% live on Praslin. More than 194,500 tourists visited Seychelles in 2011, an increase of 11.5% compared to the previous year.

Over the past 5 years, Seychelles has successfully achieved a remarkable economic growth rate. The key pillars of the economy are tourism and fisheries. The financial offshore sector has been added as the third pillar of development. This rapid economic and demographic growth, which has taken place since the early 90's is having an impact on the environment. As a result, the need to preserve the country's fragile environment has been stated as one of the challenges, which have to be addressed for the country to continue with its economic growth.

### **2.2 Problem Definition**

#### **2.2.1 General**

The Seychelles economy depends vastly on tourism and fisheries. The last ten years have seen a boom in the construction of both residential houses and touristic establishments. This rapid economic and demographic growth is having a heavy toll on the environment. As a result, the need to preserve the country's fragile environment, and in particular reduce the stress on already scarce water resources has been recognized as one of the challenges which have to be addressed for the country to continue with its economic growth<sup>2</sup>.

However the coverage with functioning sanitation systems is low, with only 15% of the population being connected to a sewer system with treatment plants and the remaining households, hotels, resorts, etc. using mostly septic tanks with limited effectiveness.

Furthermore the AWF funded Seychelles Water Supply Master Plan shows that the water deficit will reach 28.000 to 40.000 m<sup>3</sup>/d in 2030 if nothing is done to meet the water needs. The Master Plan proposes a set of investments and demand management measures aimed at meeting the 2030 demand. About €100 million will be needed to mobilise additional water

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<sup>2</sup> Seychelles Sustainable Development Strategy 2012-2020

resources, through new storages or desalination mainly. In this context, any sewage recycling scheme could show a fair economic justification through reducing costly investments.

Stormwater, which may be a possible source of water supply is not yet taken into consideration.

Climate Change will exacerbate the current problems with water supply and sanitation, since studies predict increased occurrences of extreme weather conditions resulting in extended durations of draughts as well as more frequent flooding of existing sanitation infrastructure.

On the energy side, the Seychelles are almost entirely dependent on fossil fuel imports. However, the Sustainable Development Plan for the Seychelles prioritizes the development of renewable energy. This is relevant for sanitation systems as both a consumer of electricity and a potential source for renewable energy. The Seychelles Energy Policy for 2011-2030 outlines several objectives aimed at diversifying the nation's energy base. One such objective is a focus on the institutional development of renewable energy sources, thereby stimulating and promoting investments in the energy sector. This Energy Policy has established targets of achieving 5% renewable energy share by the year 2020, and 15% by the year 2030. Seychelles' renewable energy share currently stands at below one percent 1% of the primary energy mix. Solid waste management was the responsibility of PUC until 1995, when this responsibility was shifted to the Solid Waste and Cleaning Agency under the "Environment Protection (Designation of Solid Waste Agency) Regulations, 1995". This agency is responsible to monitor and regulate waste disposal sites, authorize deposit and discharge of waste at approved sites and to monitor contamination and degradation of the environment arising from waste disposal. Waste collection, treatment and disposal is privatised (STAR Seychelles).

The Providence Landfill in Mahé is owned by MoE and operated by STAR. The total quantity of solid waste collected on the island of Mahé and delivered to the Providence landfill in 2012 was app. 62,000 tons. Currently sludge from the STP and septic tanks as from the septic tanks are dumped into landfill, which causes environmental issues.

The Providence Landfill is scheduled to be closed in 2014 and be replaced by the state of the art Providence 2 with a capacity of 360,000 tons. For a planned operating period of 16 years the waste quantity to be disposed therefore has to be reduced to an average of 22,500 tons annually. To achieve this, the preparation of a request for "bids to develop the integrated waste recovery system for the Republic of Seychelles" with a focus on recovering energy from wastes is under way.

Therefore, it will be necessary to develop a sanitation master plan based on an integrated and comprehensive approach to map out how PUC should develop the sanitation system(s). The master plan will go beyond being a one-dimensional investment plan and become a tool to contribute to a variety of different objectives: from reducing the stress on water resources by using reclaimed water and stormwater as a resource, to minimizing greenhouse gas emissions by considering the energy value of organic wastes and minimizing the energy demand of sanitation systems.

For the sake of this project, the term "sanitation" covers sewerage and faecal sludge management. Solid waste management will be included as far as the identification of synergies with the ongoing waste-to-energy initiative is concerned. Stormwater will be addressed with its effect on existing and planned sanitation infrastructure and its potential utilisation as a resource for rainwater harvesting and groundwater recharge.

### 2.2.2 Sanitation

According to the last census, 100% of the houses on Mahé, Praslin and LaDigue were served by some form of sanitation system, meaning that Seychelles has already achieved the MDG's in terms of sanitation. However, only 15% of the population is connected to water-borne sewerage systems with the rest of the population being served by on-site systems, mainly septic tanks & soak-away pits. Unfortunately, many of these individual systems are not functioning properly and constitute a significant source of pollution. Some of the large hotels located outside the sewered areas have their own sewage treatment systems, which are autonomous.

#### Sewer coverage

Currently four centralized sewerage systems exist in the Seychelles, all located on Mahé Island, serving app. 15% of the entire population:

- Greater Victoria sewerage system (3,401 connections)
- Beau Vallon sewerage system (294 connections)
- Pointe Larue sewerage system (covering the Nageon Estate; 174 connections)
- Anse Aux Pins sewerage system (covering Chetty Flats; 44 connections).

"Sewerage areas", which require all households in these areas to connect to the sewer line have not been formally declared. Therefore not all houses which could be connected to existing sewer lines are actually also connected.

The condition of the existing sewer lines is mostly unknown.

Praslin and La Digue Islands currently do not have centralized sewerage systems; however, a proposal to implement a centralized sewerage system on La Digue in 2015 is being finalised under the EIB-AFD loan.

#### Septic tanks

Apart from a few hotels, which operate their own sewage treatment plant, the majority of the remaining buildings use septic tanks with soak-pits to dispose their sewage. Due to soil- and hydrogeological conditions (rocky area with limited soil cover, partly high groundwater table) as well as insufficient design, these septic tanks often do not perform as planned, causing a significant risk of contamination. Septic sludge is removed with vacuum trucks by private service providers, causing high operation cost for the owners, resp. the PMC for housing estates. The sludge is transported to the Providence treatment plant.

#### Treatment plants

Currently four wastewater treatment plants (3 activated sludge, 1 RBC) treat water from the four sewer networks described earlier. In addition, a number of hotels operate their own sewage treatment plants and some housing estates use (pilot) treatment plants.

#### Planning approach

The PUC commissioned a study, which was undertaken by the consulting firm, M/S Safège (Ile De Reunion) to assess the needs for the rehabilitation works and the requirements to expand the sewerage network to cover other sensitive areas. The study also looked at the possibility of setting up other piped-sewerage facilities to cover Mahé, Praslin and La Digue.

However, the study was limited in scope and did not address the entire complexity of the current situation. There is therefore a need to develop a comprehensive integrated sanitation master plan for the Seychelles to map out how PUC have to develop the sewerage system to cater for the current and future infrastructure.

Other implemented, ongoing or planned studies relevant for this project are:

- Sewerage Facilities for Praslin Island, 2006
- Sewerage Facilities for La Digue Island – Feasibility Study, 2008
- East Coast of Mahé Sewerage Project (started July 2014)
- Consultancy Services for Improvement of Mahé & La Digue Wastewater Systems (to be started beginning of 2015)
- The Integrated Waste Recovery System for The Republic of Seychelles (RfP preparation in progress)

### **3 Project overview**

#### **3.1 Outcomes and impacts**

The project's immediate outcomes are the promotion of innovative and alternative approaches to sanitation based on the development of an ICSMP and the consequent ability of the Seychelles Government to mobilise funds for sanitation projects. Thus, the project will be the base for the realisation of highly innovative sanitation solutions with multi-sectoral benefits, which will have two main long-term impacts: The improvement of the Seychelles Environment and the improvement of health and sanitary conditions at the targeted islands.

#### **3.2 Output**

There will be three main outputs of the project:

- iv. Main stakeholders – PUC and concerned ministries, politicians – are aware of the value of an integrated, comprehensive sanitation planning approach,
- v. Government, PUC and stakeholders approve an integrated comprehensive sanitation master plan and
- vi. Cost effective projects are identified for submission to various funding agencies

#### **3.3 Activities**

Component 1 Comprehensive Integrated Sanitation Master Plan

- Collection, review and analysis of baseline data
- Development of Sanitation Scenarios
- Evaluation of Sanitation Scenarios
- Decision on Master-Scenario
- Preparation of Master Plan and implementation projects

Component 2 Consultation and Project Management

- Project Management
- Stakeholder Consultation, Community Participation
- Technical Assistance incl. organizing a conference on innovative technical options and integrated sanitation planning



These ToR correspond to the services requested for Component 1

## 4 Scope of Services

### 4.1 Overview

Only about 15% of Mahé's sanitation capabilities are currently accomplished through traditional western style sewerage and waste water treatment schemes. Whether this is a plus or a minus is open to debate. And under almost all of the scenarios discussed below, this is unlikely to rise beyond 40% without some dramatic intervention.

Having 85% of Mahé's largely residential sanitation requirements served by arguably poorly functioning soak pits is a real issue for the environmental health of the island today.

One reaction to this situation could be a traditional view that the solution is to sewer the whole island. If one stops and thinks about this option, the financial implications for the island and the ratepayers would be monumental. And there are hugely debateable aspects about what would be accomplished compared to other alternatives.

At the same time, others would argue that there is a whole new cadre of less-centralized sanitation options (think household level up to 20-200-2000 units) that have arisen in the past decade which could provide lower cost and potentially better – e.g. in the sense of offering potential benefits for other sectors, e.g. reduced freshwater demand, recovery of nutrients and energy – options than traditional trunk sewers and wastewater treatment plants.

There are big questions that need to be answered in thinking about the Seychelles' future with regard to sewerage, waste water treatment, reuse, energy generation – where, when and how. And from the experience of other island communities, what Mahé decides will have a decisive impact on sister islands.

In one sense, this is what Master Plans are intended to help resolve – that is, the strategic aspects of the future. One of the most important tools to consider different strategic options is the use of scenario analysis.

Figure 7 below portrays a step – critical to the success of the plan -- that involves the construction, analysis and narrowing of scenarios to a few alternatives of one decided scenario on which to base the master plan. This leads to a key question of what is meant by "scenarios".

A scenario is defined as a description of a proposed comprehensive combination of more or less centralised/decentralised sanitation systems for an island and its functions in relation to

- water resources quality protection
- human health
- water supply
- stormwater management
- reuse of water, nutrients, energy
- energy demand
- land use planning
- agriculture
- etc.

A scenario can be seen as a medium for working out what sanitation systems should look like and do.

The development of the Seychelles ICSMP will follow a planning process as shown in Figure 3 below. While the main process will follow a linear logic, this linear path will be augmented by the consideration of different scenarios.

Given the considerations outlined above, the consultant will revise the scenarios when considered necessary by the Steering Committee. In addition, we must recognize that future is uncertain and the environmental, technical and economic conditions in the coming years might significantly differ from the current forecasts. The Master Plan should therefore be easily adjustable after the completion of the services by PUC. The consultant should develop tools that will be handed over to PUC, and for which PUC staff will be trained, in order to allow the institution to adapt the master plan to new conditions.

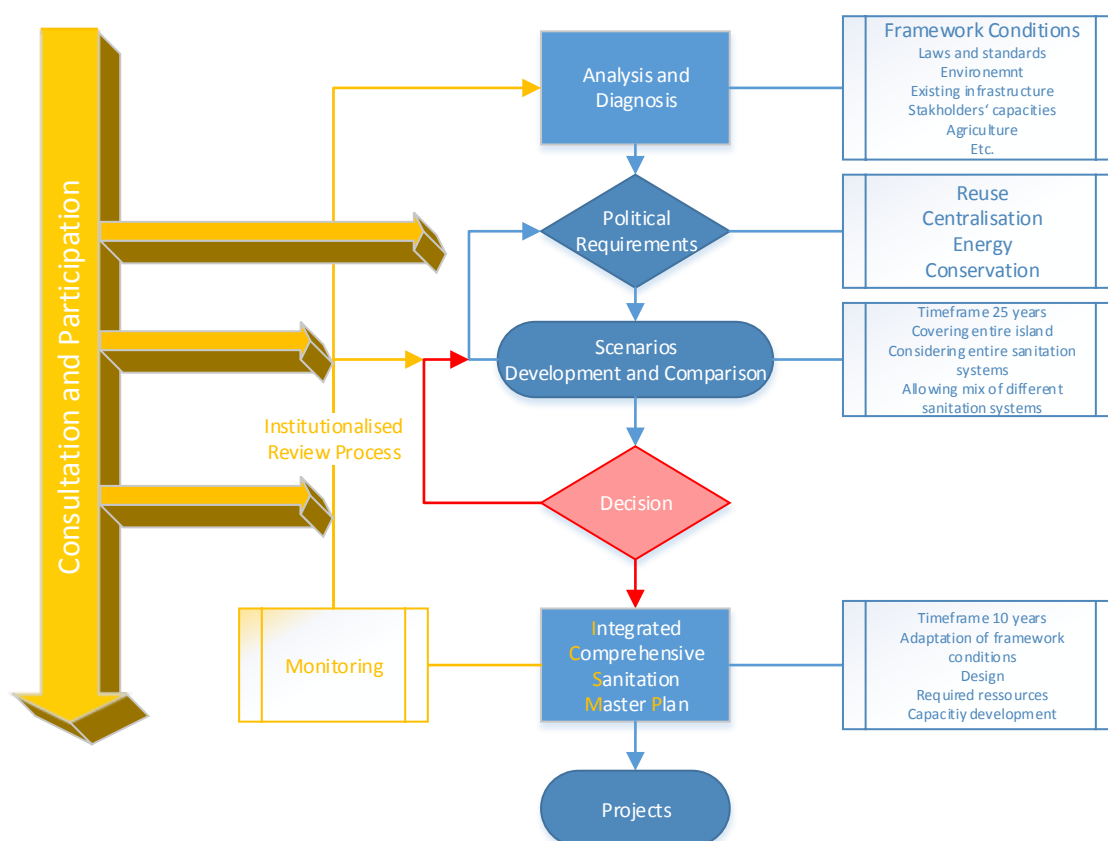


Figure 5: Sanitation planning process

## 4.2 Phase 1 – Diagnosis

The Consultant will prepare a comprehensive diagnosis of the sanitation sector and its linkages with water supply, stormwater management, waste management, energy, agriculture and land use planning. This diagnosis should give a clear picture of the current situation, and identify strengths, weaknesses, opportunities and risks of the sector, for each of the themes listed below.

This first phase of the assignment aims at providing comprehensive input for the development of sanitation scenarios in the next phase. In a first step a socio-economic and

technical survey shall be carried out aimed at assessing the state of existing sanitation facilities and infrastructure, their environmental and financial impacts, user groups capacities to pay, land use patterns in relation to possible on-site treatment and reuse options, etc.

For the sake of an integrated approach, this analysis and diagnosis of the basic framework shall not only cover existing sanitation technologies, systems and infrastructure, but also other relevant aspects like:

- Water resources

The consultant shall list, describe and map existing water resources and their current use, planned and potential water resources, in terms of both quantity and quality. Current and future use shall include a description of required qualities for different purposes.

This will include the assessment of the interest of mobilising potential alternative sources like rainwater harvesting, use of reclaimed water directly (varying degrees of centralisation) or indirectly (by groundwater recharge) and use of stormwater for groundwater recharge. For this purpose, the consultant will as far as possible identify these resources, quantify the volumes that could be used, identify the technical and legal requirements to use these resources, quantify the impact on the expected deficit in 2030 according to the water supply master plan, and finally broadly assess the technical feasibility of their mobilisation (expert assessment).

- Water quality

Review existing water quality monitoring data for different types of water resources, including potential alternative sources.

Carry out a survey (water quality analysis) on main groundwater, surface water and beaches to complete existing data in order to provide a map (baseline) of water quality (see annex 9.3).

Assess the probable sources of pollution (households, industries, agriculture, etc.) for the black spots identified.

Evaluate risks on health, environment and economic development.

- Water supply

Review the existing water supply master plan and assess proposed conservation measures including their potential impact on infrastructure construction and operation cost, energy demand, wastewater generation. Assess the potential effects of the utilisation of conservation measures and alternative sources (rainwater harvesting, use of reclaimed water, groundwater recharge) on the water supply master plan.

- Climate, climate change

Assess the risk of effects of climate change on water supply and sanitation technologies, systems and infrastructure. This assessment will be as much as possible quantified, will identify vulnerabilities and risks linked to: precipitation changes, temperature increase, and sea level increase. Map the main vulnerable infrastructures.

- Public health

Review public health records and analyse for correlations with sanitation. Map the waterborne diseases occurrences.

- Sludge reuse

Based on and in coordination with the “Integrated Waste Recovery System” study assess the potential for reusing biosolids – organic solid wastes and sewage sludge – for compost production and/or generation of electricity.

- Energy / electricity

Review current systems and infrastructure energy demand and assess the potential for increasing efficiency. Assess the potential impact of using alternative water sources (substitution to desalination in particular) on the system demand.

Prepare a comprehensive list of appropriate, innovative sanitation technologies (including decentralised to centralised treatment for reuse) with their specific energy demand and assess potential energy savings resulting from reduced freshwater demand. This reduced freshwater demand may be a result of applying one particular technology (e.g. decentralised split flow treatment may increase the overall specific energy demand of a sanitation system but reuse will reduce the fresh water demand, resulting in energy savings on the water supply side)

- Stormwater

Sewer systems are and will remain separated into sanitary sewers and stormwater drains. The consultant will review existing systems for stormwater management and analyse the impact of the current situation on sanitation infrastructures (flooding risks). Potentials for direct (rainwater harvesting) and indirect (groundwater recharge) utilisation shall be identified and described.

- Land use and urban planning

Review the approved and proposed land use plans and the Urban Master Plan under preparation and analyse their impact on sanitation infrastructure development, reuse potential, sanitation systems energy demand.

- Legal and regulatory framework

The consultant will review the existing legal framework related to water resources quality, water supply, sanitation in general, sewerage in particular, building, recycling of water and solid wastes, agricultural production, etc. and analyse the effect of the legal framework on different and in particular innovative, alternative technological options. Framework conditions which are specifically un/supportive for a particular solution shall be highlighted.

- Agriculture

Describe the main farming systems, and map the main agricultural areas of the three islands (about 200 ha of intensive agriculture, which are already mapped in a GIS). Assess the current situation with regard to agricultural production (location, area, practices, etc.), focusing on actual and potential demand for reclaimed water for irrigation and bio-solids for fertilisation and soil improvement. Considerations regarding water reclamation for irrigation shall include an analysis of mass flows both favourable and harmful to productivity.

Check the farmers' theoretical financial and practical interest to switch to a new source of reclaimed water or fertiliser (in particular versus the risk of using saline groundwater for farms located in coastal areas).

- Commerce and industry

Assess the current situation of commerce and industry – tourism, manufacturing industry – with regard to conservation and reuse potentials. Categorise industrial water demand according to required qualities and quantities. Identify and map big water consumers that could be supplied with reclaimed waste waters. Assess their needs in terms of quality and quantity, and whether their location is favourable (proximity of STP).

- Environment (sensitive areas)

The Consultant shall map environmentally sensitive areas and briefly describe their characteristics. The Land Use Maps that cover most of the Island include environmentally sensitive areas.

- Hydrogeology / geology / soil

Characterization of the soil/geological/hydrogeological setting with a focus on existing water resources and appropriateness of different technological options.

Identify and map the main aquifers and assess their current uses. Estimate the interest of a groundwater recharge, with reclaimed waste water or with stormwater.

Provide a soil/ geology suitability map for on-site sanitation, based on existing data and expert assessment. This map will focus on current and future urbanised (constructible) areas

- Institutional framework

The consultant will review the existing institutional framework and assess its suitability and capacities for integrated water resources management. Deficits and gaps shall be identified and highlighted. Major stakeholders in areas relevant for the development of the ICSMP are summarised in Figure 1. Ongoing cooperation among these stakeholders is defined in the SSDS.

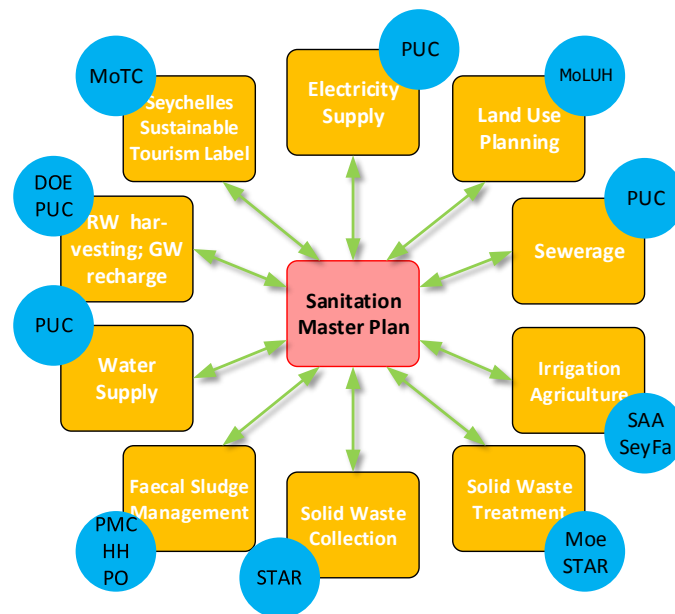


Figure 6: Stakeholders in the development of the ICSMP

#### · Tariffs structure

The current tariffs structure shall be critically reviewed with respect to (full) cost recovery – cost reflective pricing, inclusivity, steering effects (demand management), cross subsidisation and user's capacity to pay.

In addition to these aspects, the consultant will carry out a comprehensive technical diagnosis of the infrastructure: sewers and STP, on site sanitation systems. The diagnosis shall assess the state of the facilities, their effectivity, and the adequacy of the O&M systems. It shall also complete the existing PUC Geographical Information System in order to get an accurate representation of the sewer system. For that purpose, a topographical survey and CCTV (Closed Circuit TeleVision) inspection will be undertaken and the following information will be provided:

- For sewer manholes and pumping stations, at least coordinates, ground level, invert level, type, material, cover, condition and leak-tightness shall be assessed.
- For sewer line sections (section of sewer line between two manholes) internal diameter, material, length, gradient, condition and leak-tightness shall be assessed. The assessment of the sewer line sections' and manhole condition shall be based on CCTV inspections<sup>3</sup>.

The leak tightness assessment shall be based on leakage testing according to EN 1610 or equivalent standard.

<sup>3</sup> Detailed requirements in section 9.2

Information collected in the previous step shall be analysed and aggregated to a hydraulic model of existing system (software specifications attached in annex 9.4). The hydraulic model will be handed over to the client and the client's staff will be trained in using and expanding the model.

Capacities of existing wastewater treatment plants shall be assessed based on their design, performance and required standards<sup>4</sup>.

Finally the consultant shall assess current IUWM related experiences: The consultant will identify and assess existing closed loop systems (hotels mainly) that reuse treated wastewater and sludge for landscaping or golf courses mainly, as well as rainwater harvesting initiatives promoted in the country. This assessment will be aimed at identifying promising initiatives that could be up-scaled. These experiences shall be assessed from a financial, economic, environmental, public health, water saving and socio-economic perspective.

Results of this phase shall be presented as much as possible in maps based on and integrated in existing GIS systems.

### **4.3 Phase 2 – Scenarios Development and Comparison**

This strategic planning phase should compare scenarios for a 25 year planning horizon in a comprehensive manner.

#### **4.3.1 Technology Options**

In a first step the range of applicable, possible technical options needs to be re-defined and expanded beyond what is currently used, including technical options at all levels, from wastewater generation to transport and to treatment for further reuse or disposal.

For an integrated planning approach, it will be necessary to consider a much wider range of technologies, and in the case of reuse the required quality for the specific purposes, e.g.:

- At the source - source separation, split flow treatment (e.g. constructed wetlands, green walls, RBC, SBR, MBR, MBBR, etc.), recycling (e.g. for toilet flushing, irrigation, process water)
- Conveyance – gravity sewer, vacuum sewer (simplified, solid-free sewer – not recommended), transport by tankers
- Treatment (for reuse)
  - water: ABR, UASB, trickling filter, RBC, activated sludge, SBR, MBR, MBBR
  - biosolids: dewatering (reed beds, presses), composting, digestion (biogas-electricity), incineration (heat-electricity)

#### **4.3.2 Scenario Development**

In the following, different scenarios will be developed.

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<sup>4</sup> Activities to this end are planned to start within another project and interim results are expected to be available mid-2015.

A scenario is defined as a desired ultimate state of sanitation infrastructure and services, e.g. in its most simple and conventional form one centralised sewerage system for an entire island.

Scenarios will range from traditional approaches to highly innovative approaches and technology options, considering different degrees of centralisation/decentralisation, reuse of treated wastewater and sludge (separately and jointly with other organic wastes), split flow treatment, demand side measures, etc. The scenarios should include a conventional scenario to allow comparison – the project approach assumes that a scenario based on an integrated approach achieves higher benefits, which have to be shown in relation to a conventional ‘comparator’ scenario.

Scenario development should not be hindered by the current regulatory framework and current practices; scenarios may utilise technology options, which the current regulatory framework has not considered and for which it may therefore be inhibiting. Also proposed technology options’ performance may deviate from currently valid standards. In these cases, the scenarios will highlight and justify required measures to create a supportive environment for these technologies (e.g. amendment of standards). Scenarios will consider political requirements, manifested in strategic documents and planned developments in other sectors, e.g. agriculture, land use, water supply, solid waste, as well as their impact on these sectors.

The scenarios shall be prepared for a number of logically definable areas, typically an entire island. In case mass flows (of water, wastewater, waste) crossing boundaries of these areas are identified, interface conditions will have to be defined to be able to quantify the effect of these mass flows on criteria used for comparison of scenarios. If for example solid waste is “exported” from island A to island B, the effect of this export has to be considered for island A’s scenario in terms of a share of criteria values (cost, benefits, energy, etc.) from island B’s scenario.

Scenarios shall be developed including feasible combinations of new and conventional technologies as well as different degrees of centralisation.

For example, one scenario could be aimed at maximising waste water reuse, another one could be maximizing decentralised process with close re-cycling loops.

Every scenario description shall include

- A description of
  - the proposed technical solutions (conservation, recycling at source, conveyance, treatment, reuse) foreseen for all different locations in the targeted area
  - the estimated mass flows (water, sludge, COD) and energy requirements
  - estimated infrastructure dimensions
  - estimated cost of investment, broken down by units
  - estimated cost of operation and maintenance (by units)
- Plans/maps indicating essential units, highlighting areas with different sanitation systems based on approved resp. proposed land use plans.
- A justification of the allocation of sewage / on site sanitation areas.
- An estimate of the number of users served by the different systems proposed.
- A description of the implications of proposed systems and technologies on existing standards and regulations.



- An assessment of the scenario impacts on the Water Supply Master Plan (waste water reuse, conservation measures, etc.) as well as on other planning documents and major initiatives such as the waste-to-energy program.
- Soft measures, as awareness creation campaigns, behaviour change activities (social marketing), capacity building, etc. shall be defined and thoroughly described and costed.

#### 4.3.3 Scenario Evaluation

The consultant will develop a multi-criteria assessment of the scenarios. The criteria will be discussed with PUC, and could include:

##### Financial assessment

- cost (actual cash value method; parameters (interest rate, lifespan of investment, O&M cost, reuse profit, period of consideration, etc.) to be agreed with PUC; in case of differing lifespans residual values at the end of the period of consideration will be included).
- minimum tariff to cover O&M cost, to cover full system cost
- energy/electricity demand

##### Economic assessment

The consultant shall specifically propose a method for the economic assessment of the scenarios. It should assess all secondary benefits linked to the protection of environment and the reuse of wastewater and sludge. All cost and benefits shall be assessed in economic prices.

In particular, investments and measures related to conservation, rain-water harvesting, waste water reuse, sludge re-cycling shall be assessed in detail to analyse their relevance at the national level: these measures might not show a financial interest, but may make sense economically at the national level. Based on this analysis, proposal of compensation measures for PUC (such as subsidies) will be proposed.

##### Environmental assessment

The environmental impacts of each scenario shall be broadly assessed. The assessment criteria will include:

- Impact on ecosystems and water quality
- Socio economic impacts, including possible house hold relocation and financial impacts on households budgets

##### Climate Change assessment

The consultant shall estimate the carbon footprint of each scenario (construction and operation and maintenance) and compare their degree of resilience to climate change effects.

The final selection of evaluation parameters shall be made in agreement with the client.

The result of this step of performance evaluation will be a comparison of different scenarios in the form of a matrix, showing every scenario's performance in relation to agreed

evaluation criteria. To simplify this comparison where possible and agreeable a conversion of a criterion into cost may be taken into consideration (e.g. electricity demand is partly reflected in cost; environmental cost of electricity generation may be included by increasing unit prices<sup>5</sup>).

Based on the outcome of the scenario development and comparison step, an informed decision for a “Master-Scenario” will be taken by the Steering Committee, which will then be developed into a Master Plan. The consultant will facilitate this decision making process. This Master Scenario may be a mix of the previous scenarios, and will therefore be assessed based on the same approach.

Due to the nature of the integrated approach, the Sanitation Master Plan will have an influence on, and be influenced by plans in other sectors and this will have to be taken into account accordingly.

To enhance the flexibility of the planning approach as well as its effectiveness the Consultant will propose an institutionalized monitoring system, with a continuous feedback into a regular review process. It has to be noted, as mentioned earlier, that this process may require iteration depending on the acceptance of the developed scenarios.

#### **4.4 Phase 3 – Master Plan**

Based on the “Master Scenario” developed and agreed upon in phase 2 the consultant will prepare an Integrated Comprehensive Sanitation Master Plan for a planning period of 10 years.

##### **4.4.1 Prioritisation**

Justified by a problem analyses, based on the state of existing infrastructure, environmental conditions, water resources quality, etc., investments in hardware and software activities shall be prioritised for a 10-year planning period.

##### **4.4.2 Preliminary design**

For these prioritised investments, preliminary design documents will be prepared and form the base for a cost estimation.

The preliminary design is meant to bridge the gap between the design concept (Master Scenario) and the detailed design phase. In this task, the overall system configuration will be defined, and schematics, diagrams, and layouts of the project prepared to provide early project configuration. During detailed design and optimization, the parameters of the parts being designed will change, but the preliminary design focuses on creating the general project framework.

The preliminary design will comprise at least

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<sup>5</sup> e.g. European Commission Directorate-General for Research Sustainable Energy Systems: Externalities of Energy Methodology 2005

- summary of baseline data, inclusive of additionally collected baseline data where required:
  - topographical survey
  - soil and geotechnical survey
  - specific cost information (investment, O&M)
- a description of design assumptions, design parameters
- Development of a graphical solution of the concept, considering technical, environmental, social, economic, functional, energy and reuse specific requirements and including the integration of all relevant sectors and stakeholders.
- Integration of existing designs
- Description of planned facilities and infrastructure
- Graphical presentation of the entire draft design (site plans 1:5000, facilities 1:500-100)
- Cost calculations for both investment and operation and maintenance, broken down by units (to be defined jointly with the client).

The consultant shall specify in its technical offer the scope of the topographical and geotechnical investigations that will be undertaken in phase 3.

#### 4.4.3 Accompanying measures – awareness, behaviour change, capacities

This 10-year Master Plan may be based on a number of conditions and assumptions, which have to be realised in order to guarantee its successful realisation. Therefore a number of accompanying measures, ranging from development of additionally required capacities of relevant stakeholders (e.g. PUC O&M capacities), to awareness creation, respectively behaviour change activities (e.g. policy awareness, demand side measures, reuse) may be required and shall be planned for. This plan of “soft” activities shall clearly show the perceived deficit, target group, activities, costs and timing within the 10-year plan. Each measure will be described in terms of objective, content, cost, schedule, priority in a separate sheet.

#### 4.4.4 Economic and financial analysis

Additionally an economic analysis of the entire sanitation service system under PUC shall be prepared including the newly planned facilities. The consultant will refine the economic analysis undertaken in phase 2.

The consultant shall also undertake a financial analysis for PUC. This analysis should take into account the existing financial model of PUC, which covers water, sanitation and electricity. Indeed Electricity revenues are currently subsidizing the sanitation sector, and the financial impact of the master plan on PUC should be looked at comprehensively. The analyses should include 2 or 3 scenarios, based on tariff assumptions. These tariff assumptions should be based on a comprehensive tariff analysis supported by the results of the socio-economic survey and proposing alternative structured tariff options for O&M cost recovery / full cost recovery including incentives for demand side management. Each scenario should assess the external financing needs for PUC, based on a ten year implementation plan of the investments.

The financial analysis will also address the impact of the measures proposed at the household level: rainwater harvesting, separation at the source, rehabilitation of septic tanks, etc. The consultant shall in particular assess whether the promotion of these

measures requires subsidies and propose a financing channel (Government, PUC, dedicated fund, etc.).

The financial impacts on the main industries and on the tourism sector will also be evaluated. For this purpose, the Consultant will select the main industries as well as a typology of hotels.

#### 4.4.5 Environmental Assessment

An environmental assessment shall be prepared following the requirements of the Environment Protection (Impact Assessment) Regulations 1996.

#### 4.4.6 Financing strategy

Based on the needs of the Master Plan and an assessment of donors' interest, PPP potential, Government capabilities (debt ceiling) a financing strategy shall be developed that summarises targets and the actions to be taken to achieve the targets. The financing strategy shall focus on investments (including accompanying measures) but also make proposals on financing of O&M cost. The consultant shall participate in a final donors' conference. The Consultant shall assess the potential for mobilizing carbon finance of the Master Plan.

#### 4.4.7 Sequencing

Prioritised investments will then be arranged in logical sequences (projects), optimizing the utilisation of available (financial) resources and utilizing synergies (e.g. with other sector's activities) as much as possible. The result will be an investment plan for a 10-year period, which is on the one hand based on an integrated comprehensive approach and on the other hand taking priorities and actual capacities for implementation into account. The sequencing will be mapped in a simplified scheme to facilitate the understanding of the phasing.

## **5 Assignment implementation and overseeing arrangements**

### **5.1 Implementation Arrangements**

#### 5.1.1 Structure

The project will be implemented by PUC / PMU (Project Management Unit) with the support of a TA (Technical Assistance). The TA will support PUC and the Consultant with regard to integrated sanitation planning approaches and methodologies and innovative, alternative technologies. The TA will advise PUC to direct the Consultant.

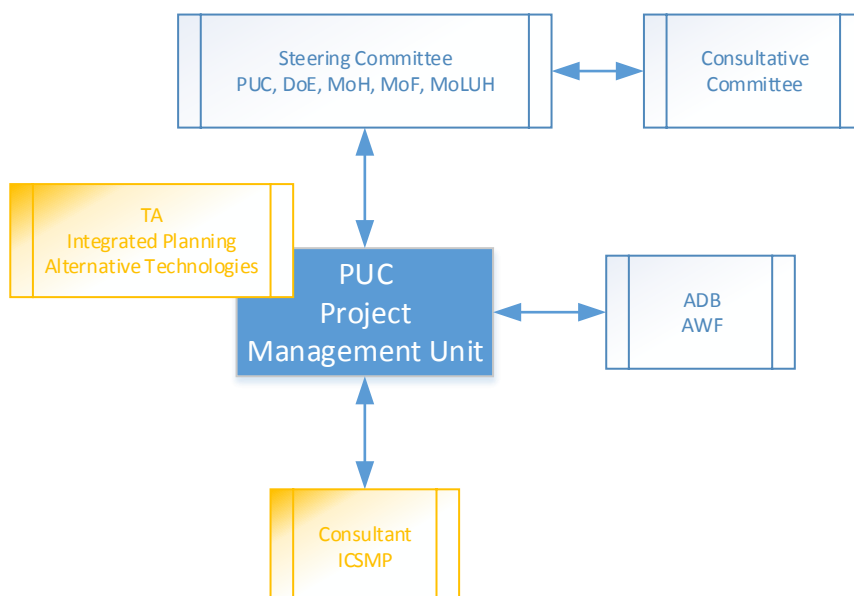


Figure 7: Project implementation structure

#### 5.1.2 Facilities, Equipment and Data Provided by the Consultant

The consultant shall provide his own facilities, tools, consumables, etc. to enable him to carry out all required activities in a timely, effective and efficient manner.

#### 5.1.3 Inputs Provided by the Client

The client will, within his capacities, facilitate

- access to existing information, documentation
- meetings with relevant stakeholders
- consultative meetings and workshops (logistic covered by the client)

## 5.2 Project Steering and Monitoring Arrangements

### 5.2.1 Project Management Unit

PUC has a permanent project management unit (shown in Figure 8) which will also be responsible for the management of this project. The Project Management Unit (PMU) is headed by a Project Director, who is answerable to the Deputy Chief Executive Officer (Head of Planning & Business Development). The Project Director is assisted by a co-ordinator for planning & monitoring of project activities.

### 5.2.2 Steering Committee

A steering committee composed of the main ministries concerned by water, sanitation, waste and energy, and including the Ministry of Finance will validate the main outputs of the study.

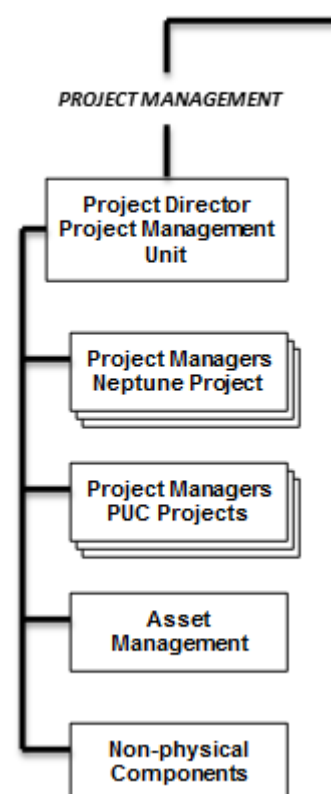


Figure 8: PUC Project Management Unit

Proposed members of the steering committee are: Public Utilities Corporations, Technical Assistance, Department of Environment, Ministry of Health, Ministry of Finance, Ministry of Land use and Housing. The consultant will participate in the Steering Committees and prepare PowerPoint presentations for the meetings.

Steering committee meetings will take place on average every 3 months.

#### 5.2.3 Project monitoring process

Project progress monitoring will be based on a continuous informal information flow between the consultant and PUC but also on formal regular monthly project meetings, which will be called and organised by PUC.

Deliverables shall be submitted according to the agreed schedule to PUC/PMU for review and approval.

### 5.3 Consultative Meetings and Workshops

Sanitation is a sensitive issue, and a sound consultation process will be implemented to support the development of a Master Plan. This consultation process will be managed by PUC, with the support of the consultant and be organized at two levels:

#### 5.3.1 Consultative committee

Three consultative committee meetings with the main stakeholders will be the main forum for discussing the (interim) results of the study, in order to inform on and guide steering committee decisions.

PUC will lead these meetings which will be prepared jointly with the consultant, who will participate at the meetings, present (interim) results and points for discussion and prepare the minutes.

#### 5.3.2 Public meetings

Furthermore, public meetings will be organized to obtain a direct feed-back from the population. PUC will call for three public meetings, which will be prepared with the support of the consultant, who will participate at the meetings, and prepare the minutes including implications of the discussions on scenarios and the master plan.

### 5.4 Donors Mobilisation

In order to achieve outcome 1 of the project, potential donors will be involved in the project as early as possible by sharing project progress and interim results bilaterally and by an organized mission to Mauritius to meet donor's representatives. The consultant will organize and participate in the mission to Mauritius. The consultant will also, in coordination with PUC organize, and participate in, a final donor's conference at the end of the project. All logistical costs related to the donors' conference will be covered by PUC.

## 6 Deliverables

## **6.1 General project reporting**

Quarterly progress notes (5 pages maximum) will be submitted to inform on the projects implementation process with regard to time, milestones and deliverables.

At the end of the project a final report will be prepared summarizing the project's implementation process and all deliverables as required below.

Every report shall be submitted as a draft for review and comments (soft copy). In case of comments the report shall be revised accordingly and a final report submitted within 2 weeks of receiving comments first in soft copy, and after approval, in 8 hard copies.

## **6.2 Diagnosis report**

A draft report on phase 1 will be submitted within 2 months from the commencement date.

## **6.3 Strategic Plan**

### **6.3.1 Proposed Scenarios**

Four months after commencement date a report with a comprehensive description of scenarios proposed for evaluation and comparison shall be submitted for approval before proceeding with further work on the scenario development.

This report shall be submitted in original electronic form.

### **6.3.2 Final scenario evaluation and comparison**

Six months after commencement date a draft report on comprehensive evaluation and comparison of scenarios shall be submitted for approval.

Within a period of one month the client will either approve the scenario comparison and proceed with selecting a "Master-Scenario" or return the scenario comparison to the consultant with a clear explanation for modification.

The required modifications will be presented in a final report on scenario evaluation and comparison within one month from receiving the client's comments.

## **6.4 Master Plan**

Twelve months after the commencement of the project the draft 10-year ICSMP shall be presented, including at least:

- Master-Scenario's prioritised activities for the 10 year period including justification
- Master plan description (text and plan)
- Preliminary design (schemes, drawings, calculations)
- Cost calculation (investment, operation and maintenance)
- Economic analyses (cost of service, cash flow forecast, etc.)
- Tariff systems' options
- Accompanying measures (type, scope, timing, cost)

Based on comments received from the client a final 10-year ICSMP report shall be submitted 14 months after commencement of the project.

## 6.5 Schedule of Deliverables

Table 7: Schedule of Deliverables

	Due date
Draft Diagnosis Report	T0 + 2
Final Diagnosis Report	T0 + 3
Proposed Scenarios Report	T0 + 4
Draft Scenarios Report	T0 + 6
Final Scenarios Report	T0 + 8
Draft Master Plan	T0 + 12
Final Master Plan	T0 + 14

## 7 Duration

The project shall be implemented within a period of 14 months.

## 8 Required Expertise

### 8.1 Team of Experts

The services will be provided by a team of suitably qualified experts, an appropriate mix of local, regional and international experts will be required. The estimated man months input will be 45.

### 8.2 Qualifications and Responsibilities of Team Members

Phase 1 – Infrastructure survey and water quality monitoring may be subcontracted.

#### 8.2.1 Team Leader

Experience:	Minimum of 15 years of working experience in infrastructure planning in developing countries, minimum of 5 years as project manager of projects of comparable size and complexity, prior working experience in Seychelles would be an asset.
Education:	Experience with integrated planning approaches required. At least MSc degree or equivalent in civil engineering, sanitary engineering
Proven working experience in the following fields:	Project Management Training and capacity building Monitoring and evaluation

#### 8.2.2 Sanitation Expert

Experience:	Minimum of 10 years of working experience in sanitation planning and projects in developing countries.
Education:	At least MSc degree or equivalent in civil engineering, sanitary engineering



Proven working experience in the following fields:	Integrated sanitation planning Master plan development Alternative sanitation technologies and systems Reuse of water and biosolids Cash value analyses Hydrology Hydraulic modelling of sewer systems
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### 8.2.3 Water Supply Expert

Experience:	Minimum of 10 years of working experience in water supply planning and projects in developing countries.
Education:	At least MSc degree or equivalent in civil engineering or comparable
Proven working experience in the following fields:	Reuse (industry, household, etc.), dual systems Groundwater recharge (quality aspects) Demand management Rainwater harvesting

### 8.2.4 Agronomist reuse

Experience:	Minimum of 10 years of working experience in agricultural reuse of wastewater and biosolids.
Education:	At least MSc degree or equivalent in agriculture
Proven working experience in the following fields:	Alternative water sources for irrigation Composting Quality assurance related to reuse

### 8.2.5 Financial expert (tariff, PUC financial model)

Experience:	Minimum of 10 years of working experience as financial specialist (expertise in preparing, auditing, analyzing or evaluating financial statements) in particular for utilities.
Education:	BSc in business sciences or equivalent
Proven working experience in the following fields:	Preparing, auditing, analyzing or evaluating financial statements Financial analyses of utilities Tariffs

### 8.2.6 Project Economist

Experience:	Minimum of 10 years of working experience as an economist with infrastructure and environment projects
Education:	MSc in Economics
Proven working experience in the following fields:	Costs and benefits analyses of infrastructure investments Environmental economics

### 8.2.7 Environmental Expert

Experience:	Minimum of 10 years of working experience in developing countries
Education:	MSc degree or equivalent in environment or related field (water, biology, etc.)
Proven working experience in the following fields:	EIA of infrastructure projects in the water sector Water resources quality, climate change Energy, reuse

### 8.2.8 Hydrogeologist

Experience:	Minimum of 10 years of working experience in developing countries
Education:	MSc degree or equivalent in related field (geology, hydrogeology, etc.)
Proven working experience in the following fields:	Groundwater recharge

### 8.2.9 Solid Waste Expert

Experience:	Minimum of 10 years of working experience in developing countries
Education:	MSc degree or equivalent in civil engineering, waste management, or comparable
Proven working experience in the following fields:	Digestion, incineration, treatment of sewage sludge, reuse

### 8.2.10 Socio-economist

Experience:	Minimum of 10 years of working experience in International Development and Environmental Studies
Education:	MSc degree or equivalent in Economy, Anthropology, Social Sciences, etc.
Proven working experience in the following fields:	Social impact of (sanitation) infrastructure development Capacity needs assessment, awareness creation, behaviour change

## **9 Annex**

### **9.1 Available information**

- Chang-Seng, Denis (2007): Climate variability and climate change assessment, Report for Ministry of Environment and Natural Resources, United Nations Framework of Climate Change (UNFCCC)
- Chang-Seng, Denis (2007): Seychelles climate change scenarios for vulnerability and adaptation assessment,
- Chang-Seng, Denis (2008): Climate change impact and adaptation activities in the water sector, United Nations Framework of Climate Change (UNFCCC)
- Environment Protection Act – Schedules
- Environment Protection Act (Subsidiary Legislation) 1996
- Environment Protection Act 1994
- Gibb East Coast Study
- Marquise, David, Iris Richter (2013): Carrying Capacity Study of La Digue Island
- Public Health Act 2012
- Safege (2011): Seychelles Sewerage Master Plan
- Sewerage Facilities for La Digue Island – feasibility study
- Sewerage Facilities for Praslin Island 2003 Inception Report
- Sewerage Facilities for Praslin Island 2006 Design Report
- Seychelles 2012-2020 Tourism Master Plan
- Seychelles 2012-2020 Tourism Master Plan
- National Bureau of Statistics (2011): Seychelles in Figures
- Seychelles Sustainable Development Strategy 2012-2020
- The Seychelles Land Use Master Plan (development in progress)
- The Seychelles Water Development Plan 2008-2030
- MoLUH WebGIS [http://www.webgis.gov.sc/map\\_default.phtml](http://www.webgis.gov.sc/map_default.phtml)

### **9.2 CCTV Requirements**

For all CCTV inspections, both sewers and the adjoining manholes must be inspected and their condition assessment documented. All description of defects, findings and abnormalities shall be in full. Defects classification shall be in accordance with the WRc/WAA "Manual of Sewer Condition Classification" 5<sup>th</sup> edition. Photographic evidence of each defect must be taken and included in the CCTV Inspection Report.

Prior to CCTV inspection, hydraulic cleaning of sewer(s) and manhole(s) must be carried out to assess their condition with an unobstructed view of their surfaces. CCTV inspection of all sewers must cover the entire pipe length and should be carried out during low flow period (ideally water level should be less than 30% of the pipe diameter) for adequate viewing of the sewer condition. The positioning of the CCTV camera lens shall be in a stable condition and above the liquid flow line near the central axis of the sewer(s) and manhole(s). The speed of the CCTV unit in the sewer(s) and manhole(s) shall be limited to 0.20 m/s to enable all details to be extracted from the video recording. All CCTV videos recording shall be of high quality recording and in a stable condition. During televising, the illumination must be adequate to provide an accurate and clear record of the entire sewer's and manhole's internal condition. All documents including recordings should be submitted in DVD discs or

USB drives. Submission format of video and photos should be in MPEG/AVI and JPEG format respectively. Each individual entire length pipe between manhole to manhole must be included in a single MPEG/AVI video file, except if a reverse set up is required due to an obstruction, in which case the reverse inspection shall be contained in a separate file. Each individual manhole must be included in a separate MPEG/AVI video file. At the start of each pipe length being inspected, the length of pipeline from zero chainage up to the cable calibration point shall be recorded and reported in order to obtain a full record of the pipe length. The meter reading entered on to the data display at the cable calibration point must allow for the distance from the start of the survey/inspection to the cable calibration point such that the chainage at the start of the survey is zero. The running footage display shall be consistent with the actual distance of the pipe from the start of the pipe length. At the start of each sewer pipe length, a data generator shall electronically generate and clearly display on the viewing monitor and video recording a record of data in alpha-numeric form containing the following minimum information:

- Project Reference Number
- Sewer GIS ID
- Upstream and downstream manhole GIS IDs
- Sewer pipe diameter
- Sewer pipe material
- Direction of unit travel
- Road name/location
- Date and time of survey
- CCTV company name

Automatic update of the unit's chainage position in the pipeline from adjusted zero

The text should be clearly displayed on a contrasting background for approximately 5 seconds.

If the CCTV inspection is being performed on consecutive pipe segments with the same setup, this text information must be provided at the start of each pipe segment and the separate pipe segment will have to be saved in separate MPEG/AVI video file.

During CCTV inspection, the running screen must include the following information. The display of this information must in no way obscure the central focus of the pipe being inspected.

- Project Reference Number
- Sewer GIS ID
- Upstream and downstream manhole GIS IDs
- Sewer pipe diameter
- Sewer pipe material
- Direction of unit travel
- Road name/location
- Date and time of survey
- Running footage (distance travelled)

At the end of CCTV inspection of the inspected pipe segment, the ending screen text should indicate:

- Project Reference Number

- Sewer GIS ID
- Upstream and downstream manhole GIS IDs
- Sewer pipe diameter
- Sewer pipe material
- Direction of unit travel
- Road name/location
- Date and time of survey
- Running footage (distance travelled)

The text should be clearly displayed on a contrasting background for approximately 5 seconds.

The video shall be free of all electrical interference and excessive background noise. Digital video recording playback shall be at the same speed that it was recorded.

After cleaning, both the sewers and the adjoining manhole shall be visually inspected by means of CCTV camera system. The inspection will be done one manhole-to-manhole pipe section at a time. Each series of runs shall be recorded on a separate file.

The direction of unit travel shall be in the direction of flow in the pipe unless access to the upstream manhole is not possible or the unit cannot pass through the pipe from the end-to-end in the direction of flow, in which case a reverse setup will be allowed.

CCTV inspection shall be carried out to all the manholes adjoining to the inspected sewers. All observations and findings shall be highlighted on the separate Manhole Inspection Report. Manhole inspection shall include (but not limited to) the following structural defects:-

Damage manhole frames and/or covers (including rocking manholes)

Signs of inflow/infiltration/exfiltration from the manhole walls

Damage benching

Sewerage pipes of sizes up to 450mm (inclusive) shall require CCTV unit with pan and tilt facilities. For sewer(s) more than 450mm diameter, CCTV unit with pan, tilt and zoom facilities shall be used to allow clear interpretation of all defects and their severity.

Upon the completion of each and every required survey inspection work, the results obtained from the CCTV survey of the sewer line(s) and the adjoining manhole(s) are to be incorporated into the CCTV Inspection Report.

The following items shall be submitted:

Hardcopy of computer generated (not hand-written) CCTV Survey Inspection Report on condition of each sewer segment inspected between manholes. This report shall contain an overall plan of the pipeline(s) and manhole(s) inspected during the period, structural assessment and a summary of the findings.

The sewer report shall be labelled as:

Sewer GIS ID-mmddyy-Project Ref no.

Hardcopy of computer generated CCTV Survey Inspection Report on condition of each manhole inspected shall be reported.

This report shall contain an overall plan of the manhole inspected during the period, structural assessment and a summary of the findings.

The manhole report shall be labelled as:

Manhole GIS ID-mmddyy- Project Ref no.

A DVD disc or USB drive containing the softcopy of CCTV survey inspection reports (in PDF format) and CCTV videos.

Each sewer and manhole shall be saved in the respective individual folders.

The naming convention for each folder (sewer and manhole) and the corresponding CCTV survey inspection report and video is shown below:

Each sewer segment should be saved in individual folder. Naming convention is as follows:

Sewer Folder

(Folder Name: Sewer GIS ID-mmddyy-Project Ref no)

A PDF softcopy of the CCTV Inspection Report of the sewer segment.

Save CCTV report as: Sewer GIS ID-mmddyy- Project Ref no.pdf

Sewer CCTV survey video in MPEG/AVI format

Save as: Sewer GIS ID-mmddyy-C-Project Ref no.mpeg or avi

Each manhole should be saved in individual folder. Naming convention is as follows:

Manhole Folder

(Folder Name: Manhole GIS ID-mmddyy- Project Ref no.)

A PDF softcopy the CCTV Inspection Report of the manhole inspected.

Save CCTV report as: Manhole GIS ID-mmddyy-Project Ref no.pdf

Manhole CCTV survey video in MPEG/AVI format

Save as: Manhole GIS ID-mmddyy-Project Ref no.mpeg or avi

Any errors in recording, CCTV imagery, unclear video printouts and/or error in interpretation of the sewer(s) and/or manhole(s) defect, shall be rejected.

The minimum size of the video prints shall be 100 mm x 75 mm. The photographic evidence (Video prints) of defects and abnormalities must be included in the CCTV Inspection Report.

Video prints shall be taken in the event of the following observation and findings:

Photographic evidence (video prints) shall be taken for all suspected defects. That is

- sewer pipes fractures, broken, collapse, deformation, displaced, sunken, pipes with sever joint displacement and abnormalities,
- sewer liners suffering from peeling, deformation, bulging, broken, collapse, etc. and abnormalities,
- lateral openings where there is accumulation of debris at particular localized spots, etc. that the CCTV specialist comes across during the CCTV assessment.

Where video prints are not otherwise required for a generally well maintained sewer (i.e. no evidence of defects or abnormalities etc.) then video prints shall be taken for every and successive 15m interval of a sewer segment inspected (to determine the changes of sediments level, etc. over the entire length of sewer inspected).

To illustrate degree of mortar loss, size of a crack or fracture, size of a void or any other quantifiable defect and a suitable metric scale shall be included in the clearly focus video printout. Where a video printout is taken to illustrate a specific defect, it shall occupy the central part of the video printout and be clearly in focus and accurately reflect the defect.

Where a defect is continuous or repeated, the video printouts shall be taken at the beginning of the defect and at not less than 5 m intervals thereafter.

### **9.3 Water quality monitoring programme**

#### **9.3.1 Beaches**

No. of locations	15
No. of samples/location	3
Type of samples	qualified grab samples
Proposed Parameters	pH, EC, T, total coliforms, faecal coliforms, TOC, PO <sub>4</sub> , NH <sub>4</sub> , NO <sub>3</sub>

#### **9.3.2 Groundwater**

No. of locations	3
No. of samples/location	3
Type of samples	qualified grab samples
Proposed Parameters	pH, EC, T, total coliforms, faecal coliforms, TOC, PO <sub>4</sub> , NH <sub>4</sub> , NO <sub>3</sub>

#### **9.3.3 Surface water**

No. of locations	15
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No. of samples/location	3
Type of samples	qualified grab samples
Proposed Parameters	pH, EC, T, total coliforms, faecal coliforms, TOC, PO <sub>4</sub> , NH <sub>4</sub> , NO <sub>3</sub>

#### 9.3.4 Standards

Sampling, transport, preservation, handling, preparation and analysis according to EN ISO Standard Methods.

### 9.4 Sewer modelling software requirements

#### 9.4.1 Editing

- Stand-alone Windows interface
- Ability to run within AutoCAD
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Automatic element labelling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Aerial view and dynamic zooming
- Named view library
- Multiple background-layer support
- Image, CAD, and GIS background support
- Inference tool (to interpolate missing elevation data)
- Automatic calculation of elevations on pipe split operation
- Automatic input and result fields filtering (based on solver used)
- Hydraulics and Operations
- Steady-state simulations
- Extended period simulations
- Flow profile methods: capacity and backwater analysis
- Automatic constraint-based design
- Diversion simulation
- Rule-based or logical controls
- Accurate variable-speed pumping
- Pump batteries element
- System head curves
- Totalizing flow meters
- Air valves for high points in force mains
- Control structures (culvert inlet, weirs, orifices, depth-flow curve)
- Complex manifolded pump stations/force mains
- Pond outlet structure calculations
- Support for catchment elements
- Support for culvert headwalls and endwalls
- Low impact development control analysis



#### 9.4.2 Interoperability and Model Building

- Single set of model files for three compatible interfaces
- Import of MX Drainage files
- LandXML data import and export
- Polyline-to-pipe conversion from DXF and DWG files
- Spreadsheet, database, Shapefile, and OLE DB connections
- Elevation extraction from contours, points, and Shapefiles
- Elevation extraction from CAD drawings and surfaces
- Interpolating elevations between elements
- Interpolating elevations at split
- GIS-ID property (to maintain associations between records in source file and elements in model)
- Seed files (new models template)
- Oracle Locator/spatial data connection
- Automated assignment of elevation data to manhole elements

#### 9.4.3 Sanitary Load Allocation and Estimation

- Automatic sanitary load allocation from geospatial data
- Geospatial load allocation from billing meters
- Load allocation using flow monitoring distribution
- Land-use based load distribution
- Sewer load assignment based on phased land-use projections and population projections
- Dry-weather load assignment using hydrographs, unit loads, and pattern-based loads
- Customizable area-, count-, discharge-, and population-based unit sanitary loading library
- Pipe length-, diameter-, surface area-, length-diameter-, or user-defined infiltration load type

#### 9.4.4 Model Management

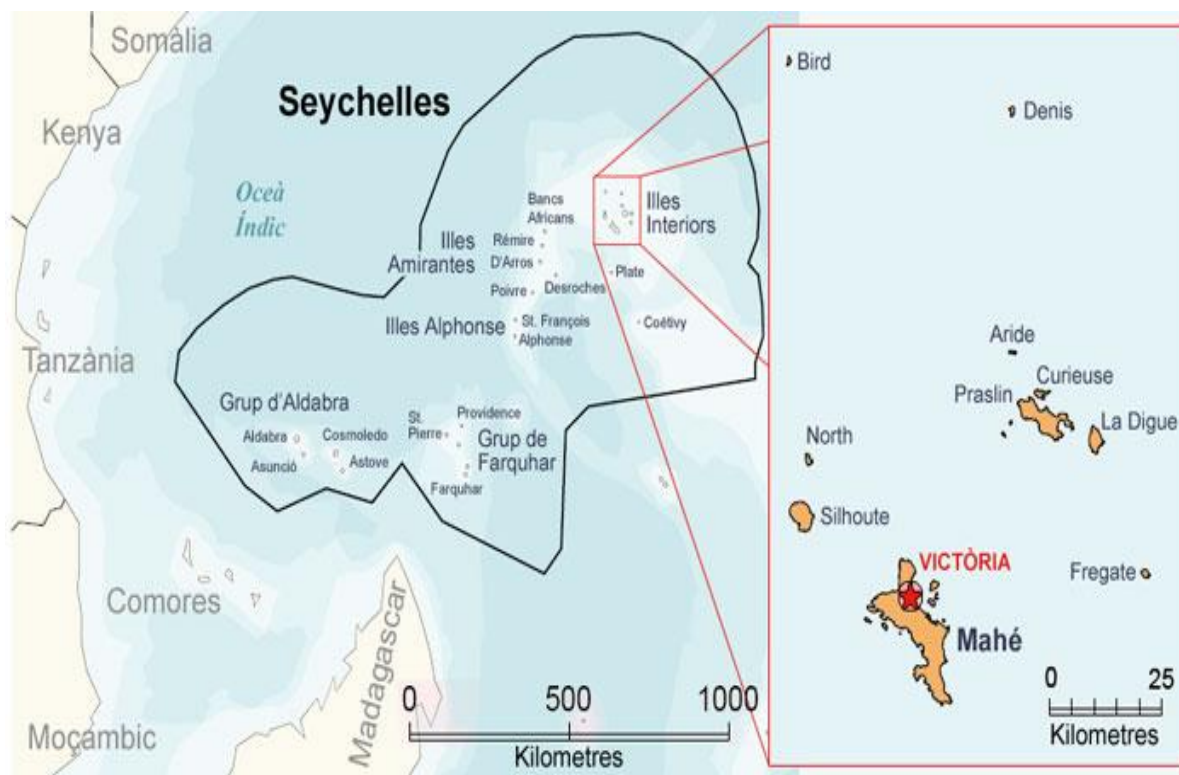
- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Scenario comparison
- Diversions displayed as links
- Active topology (to activate or deactivate network elements)
- Tabular reports with global editing
- Tabular report sorting and persistent filtering
- Table opening on selection
- Customizable engineering libraries for extreme flow factors, section size, material properties, minor losses, and unit-sanitary (dry-weather) loads
- Dynamic (query-based) and static selection sets
- Element selection by polygon
- Element selection inversion
- Statistical analysis from tabular reports
- Global engineering-units management
- Drawing review tools for consistent connectivity
- Automatic topology review
- Network navigator with dozens of useful predefined queries

- Orphaned node and dead-end pipe queries
- Hyperlink for network elements
- Custom data fields (with user-assigned or formula-based values)
- Surface water flow direction displayed across any terrain

#### 9.4.5 Results Presentation

- Thematic mapping
- Dynamic, multi-parameter, and multi-scenario graphing
- Advanced dynamic profiling
- Property-based color coding and symbology
- Property-based annotation
- Project inventory report
- Scenario summary report
- Element report and graphs
- Hydrograph graphs
- Contouring with export to Shapefile, DXF, and native CAD format
- Publishing of i-models in 2D or 3D
- Stormwater Load Allocation and Estimation
- Runoff methods: SCS Unit Hydrograph, Modified Rational Method, EPA SWMM, RTK Unit Hydrograph, generic
- Unit Hydrograph, Time-Area Method, ILSAX and user-defined hydrograph
- Time of concentration methods: User-Defined, Carter, Eagleson, Espey/ Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA and TN), Length and Velocity, SCS Lag, TR-55 Sheet Flow, TR-55 Shallow Concentrated Flow, and TR-55 Channel Flow, Friend, Kinematic Wave, Bransby-Williams and UK standard
- Loss Methods: Constant loss rate, Green and Ampt, Horton, Initial Loss and Constant Fraction, Initial Loss and Constant Loss Rate, SCS Curve Number.

## 9.5 Map of the Seychelles with Inner Island



# Annex 6: Draft ToR of the Technical Assistance

## Abridged TOR for Technical Assistance

### to the Development of the Seychelles Integrated and Comprehensive Sanitation Master Plan

#### **1 Background**

The Seychelles are faced with increasing stress on their limited freshwater resources due to rapid economic growth, climate change and inadequate sanitation infrastructure. Traditional approaches to the sanitation problems have not yielded satisfactory results. The Government and the Public Utilities Corporation (PUC) therefore proposed to develop a strategy for the sanitation sector for the next 25 years based on a new paradigm, which considers waste a resource. The strategy shall be based on an integrated approach, considering linkages and synergies with other relevant sectors, like water supply, energy, agriculture, etc.

PUC will therefore, within a project supported by the African Water Facility, managed by the African Development Bank, implement a strategic sanitation planning process, which will result in the develop of an Integrated and Comprehensive Sanitation Master Plan (ICSMP). The master plan aims at mobilising financing for the sustainable improvement of sanitation services.

The ICSMP will be developed by a consulting firm (Consultant), which will be contracted by the project.

The duration of the proposed project is twenty-two months after the date of approval.

The project document and the terms of reference for the development of the Seychelles Integrated and Comprehensive Sanitation Master Plan are attached.

#### **2 Objective**

The ICSMP will be based on an Integrated Urban Water Management (IUWM) approach, which will identify and utilise 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.

The ICSMP development will start with analysing currently existing framework conditions, and continue with the development of different sanitation scenarios which will consider varying degrees of demand side measures, reuse of treated wastewater and sludge, decentralisation and in general interdependencies with other relevant sectors, like solid waste, urban planning, etc. and be based on innovative technological options. Based on the

outcome of the scenarios development and comparison phase, an informed decision for a Master-Scenario will be made, which will then be developed into a 10 year Master Plan.

Integrated Urban Water Management (IUWM) is a concept which is rarely used by consultants and there are very few companies with significant references in this field. Furthermore the Consultants knowledge of and experience with innovative new technologies may be limited. Lastly also other stakeholders' knowledge and understanding of integrated planning and innovative technologies is limited as well.

Purposes of this Technical Assistance (TA) is therefore to provide support to PUC, the project steering committee including other relevant stakeholders, and the Consultant for the development of the ICSMP with regard to an integrated sanitation planning process and innovative technological options.

### **3 Expected Outcome**

The Technical Assistance is expected to support PUC to achieve the project's outcomes.

The project's immediate outcomes are the promotion of innovative and alternative approaches to sanitation based on the development of an ICSMP and the consequent ability of the Seychelles Government to mobilise funds for sanitation projects. Thus, the project will be the base for the realisation of highly innovative sanitation solutions with multi-sectoral benefits, which will have two main long-term impacts: The improvement of the Seychelles Environment and the improvement of health and sanitary conditions at the targeted islands.

The TA will fill the gaps of knowledge and experience of the group of people (PUC, Consultant, steering committee, etc.) involved in the development of the ICSMP.

## **4 Key Activities**

For all key activities described below, the TA shall propose and describe strategy and methodology in his offer. The integration of the TA's activities into the development of the ICSMP shall be clearly explained-

### **4.1 Baseline survey**

The TA will conduct a baseline survey to describe the status of

- Awareness, and
- Knowledge of innovative sanitation technologies and integrated sanitation planning (as defined for this project)

of all stakeholders targeted with this TA. Stakeholders will at least be staff from Public Utilities Corporations, Department of Environment, Ministry of Health, Ministry of Finance, Ministry of Land use and Housing and political representatives. The estimated number of stakeholders will be 30. This survey will be repeated at the end of the assignment.

### **4.2 Capacity needs assessment**

The TA will identify and describe PUC capacity-building needs, which are critical for a successful development of the ICSMP, the perpetuation of the strategic planning process and the implementation of sanitation projects, derived from the Master Plan. This assessment will take into account the current capacity building programme funded by the European Development Fund.

### **4.3 Awareness creation**

The TA will create awareness on

- (i) Integrated Urban Water Management and
- (ii) innovative, alternative sanitation technologies.

Awareness creation activities for (i) will target PUC, the project steering committee and consultative committee and political leaders. Awareness creation activities for (ii) will target PUC and the ICSMP Consultant.

The TA will propose an awareness creation plan in its technical offer and adjust it based on the baseline survey.

### **4.4 Capacity Building**

Capacity building will target PUC with regard to the following:

#### 4.4.1 Monitoring

The TA will support PUC to develop and institutionalise a monitoring system of the sanitation systems' performance, including the aggregation of the monitoring information into management data. The monitoring system shall enable the management to keep track of the performance of the sanitation systems in place, serve as a tool to evaluate planned developments and to identify priority areas for improvements.

#### 4.4.2 Strategic planning

The TA will support PUC to institutionalise a regular review process of the strategic sanitation plan and the ICSMP to ensure the continued usefulness and appropriateness of the plan given changing framework conditions and ongoing developments in the sanitation and related sectors.

The TA will propose a capacity building plan in its technical offer and adjust it based on the capacity needs assessment.

### 4.5 Support Master Plan consultancy services supervision

The TA will support the Project Management Unit (PMU) of PUC in the supervision of the process of developing the ICSMP by

- reviewing draft and final deliverables,
- providing and discussing recommendations for improvement.

The TA will make sure that all relevant scenarios are considered and proposed sanitation activities are integrated with the planning in, and the framework of other sectors.

It will be mandatory, that scenarios include at least connections with:

- Water supply by considering the impact of (i) using reclaimed water for drinking water supply, irrigation, process water in households (toilet flushing) or for industrial use and groundwater recharge, and (ii) developing demand side measures, conservation measures, and rainwater harvesting.
- Energy supply and solid waste by (i) maximising synergies with the planned waste to energy initiative (renewable energy potential of wastewater and sludge), (ii) evaluating existing and planned sanitation systems' energy demand and (iii) assessing effects of water reuse on the water supply systems' energy demand.
- Storm water management through (i) assessing the impact of floods on the sanitation infrastructure and (ii) analysing the interest of promoting rainwater harvesting measures and groundwater recharge.
- Agriculture by analysing the impact of reclaimed water and recycled sludge on productivity and production costs,

- Storm water management as far the current situation has an impact on existing and planned sanitation systems and
- Storm water management as a potential resource for water supply (rainwater harvesting and groundwater recharge).

Furthermore, the TA will provide support to the steering committee to keep the project on track, in particular regarding an integrated planning approach by

- attending steering committee meetings,
- providing advice on steering committee's decisions,
- supporting the steering committee in particular in the decision making process for a master scenario based on the Consultant's scenarios reports.

## 5 Implementation Arrangement

The project will be implemented by PUC / PMU (Project Management Unit). The TA will support PUC and the Consultant for the ICSMP with regard to integrated sanitation planning approaches and methodologies and innovative, alternative technologies. The TA will be attached to PUC as indicated in **Error! Reference source not found.** and will act as an advisor to PUC. Jointly with PUC the TA will support the ICSMP consultant in the development and comparison of scenarios.

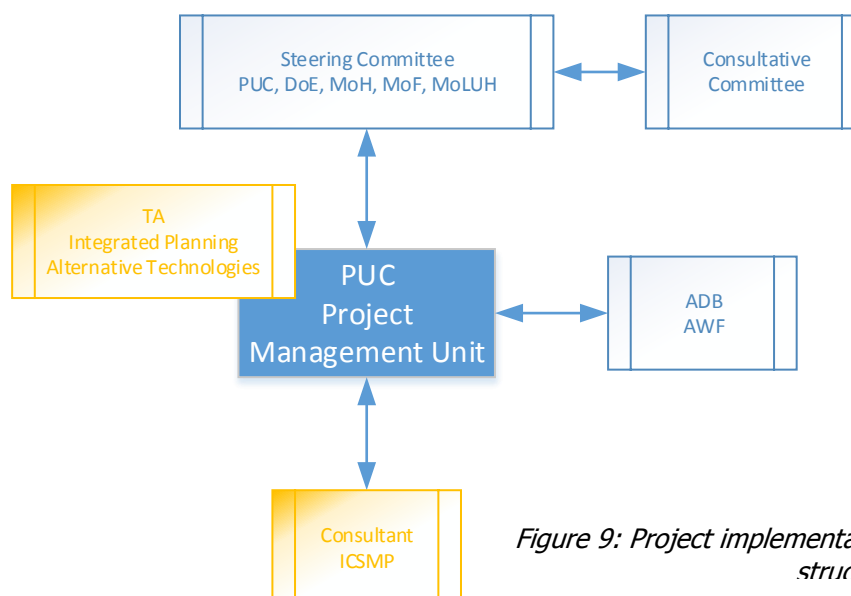


Figure 9: Project implementation structure

## 6 Required Expertise

The TA will provide personnel with proven knowledge of and experience with

- integrated urban water management,
- integrated sanitation planning,
- conventional and alternative sanitation technologies (design, construction, O&M),
- conventional and alternative technologies for reuse of resources (nutrients, organic substance, energy, water) from sanitation systems (design, construction, O&M) and
- awareness creation and capacity building.

The number of experts proposed should not be more than four.



## **7 Deliverables**

Quarterly activity reports will be submitted to inform on the TA's activities. At the end of the assignment a final report shall be submitted, summarising the TA's activities and the impact on the project's outputs. All reports shall be submitted within two weeks after the reporting period.

Furthermore specific reports shall be submitted within 8 weeks from the start of the assignment:

- capacity assessment report
- baseline survey
- awareness creation plan
- capacity building plan

Every report shall be submitted as a draft for review and comments (soft copy). In case of comments the report shall be revised accordingly and a final report submitted within 2 weeks of receiving comments first in soft copy, and after approval, in 3 hard copies.

The Consultant will submit comments on reports submitted by the Master Plan Consultant within a period of one week.

## **8 Duration**

The duration of the assignment will be 18 months. The total expected time input of the TA will be 4 person months.

## **9 Attachments**

### **9.1 Project Document**

### **9.2 Terms of Reference ICSMP**

## Annex 7: Communication and Visibility Guidelines

Communication and brand visibility greatly matter to the AWF. The AWF views communication as a strategic function firmly tied to its strategies and business objectives. Steady communication with AWF stakeholders helps build credibility and secure their trust and esteem, which in turn, helps AWF build and protect its reputation. Communications is also about disclosure. The AWF is a multi-donor fund, and is accountable to a Governing Council that expects the AWF to hold itself to the highest level of accountability and transparency. The AWF is committed to making every effort to disclose, share and report information useful and relevant to its stakeholders and the greater public. This entails effectively communicating its achievements, progress, and results by using all means available, in a timely manner. All these elements are important for business and essential to attract and retain donors, and for AWF to maintaining its social license to operate.

Brand awareness is about making sure the public knows AWF exists and can tell the AWF apart from other water funds or organisations. The brand is a visual, memorable trigger, or a logo, that embodies the AWF and captures its core identity. Brand awareness is achieved over time, through activities meant to increase brand visibility, by repeated use and exposure of the logo at strategic places and times. The AWF logo is used as a seal or a signature used to signal AWF financial support or special collaboration.

The AWF has established **Communication and Visibility Guidelines** to the attention of partners, AfDB regional offices and grant recipients to help AWF more effectively achieve its brand and communications objectives, as laid out in the AWF Long Term Communications Strategy 2006 approved by the AWF Governing Council in 2006.

### 1. GENERAL REQUIREMENTS

- 1.1 At an early stage, when preparing communication activities related to an AWF supported event or project, contact the Communication Officer at AWF Secretariat, copying the AWF Project Manager.
- 1.2 At a minimum, and wherever possible, the AWF logo should be applied to outreach materials that pertain to AWF supported projects or events. The proper use of the logo should be discussed with the AWF Communication Officer.
- 1.3 The AWF should be verbally mentioned as donor of the project it is funding at public speaking events where the project is discussed, and also be mentioned as donor in any Power Point presentations relevant to the project funded by the AWF, using the name and the logo of the AWF appropriately.
- 1.4 The logo is to be obtained upon request from the AWF Communication Officer.
- 1.5 Documents and publications related to an AWF supported project or sponsored publication should contain the AWF logo, as well as this phrase on the cover page: "*This project/program/study is funded by the African Water Facility*".
- 1.6 Implementing and Implementing agencies should always have a link to the AWF website on the page of their website relevant to an AWF-funded project/activity. The website is: [www.africanwaterfacility.org](http://www.africanwaterfacility.org)

- 1.7 The AWF asks that grant recipients report back to the AWF Secretariat, any special mention, award nominations or recognition that the project may have received.

## 2 VALIDATION PROCESS

- 2.1 The AWF management is responsible for the final clearance of AWF communications products/outputs.

## 3 PRESS RELEASES & MEDIA ADVISORIES

- 3.1 The AWF will issue an AWF-branded press release every time a project is approved and/or signed, and when completed (handover).
- 3.2 AWF press releases must always include a quote from the Coordinator of the AWF, which must be cleared by the Coordinator.
- 3.3 The AWF encourages and appreciates initiatives to issue joint press releases with its grant recipients. A standard joint press release can be issued at any time agreed with the AWF (between launch and completion).
- 3.4 When the grant recipient wishes to produce a press release, liaising with the AWF Communication Officer is required, as well as receiving a quote from the AWF Coordinator, as appropriate, and getting approval and clearance.
- 3.5 The AWF should be included in the title and/or first paragraph of the press release, as appropriate.
- 3.6 The press release should incorporate the AWF logo, mention that funding was provided by the AWF, and mention the amount of the AWF funding.
- 3.7 If a press conference is planned, the press release should include the name of an AWF senior representative who will be present at the press conference, when relevant.
- 3.8 All press releases must bear the name and contact information of the AWF Communication Officer, and if possible that of the communication/media representative from the grant recipient.
- 3.9 The AWF boilerplate text ("About the AWF") must be added to the text, including the AWF web site address. Please contact the AWF Communication Officer for the latest version.
- 3.10 The AWF has final validation of all its press releases, following a review process involving reviewers.
- 3.11 The rules above also apply to media advisories.

## 4 PRESS CONFERENCES

- 4.1 Press conferences to launch projects funded by the AWF should be organized in cooperation with the AWF, as much as possible.
- 4.2 The invitations should bear an AWF logo.
- 4.3 The AWF logo of a visible size should appear on any banner or poster to be displayed at the site of the conference.
- 4.4 Press kits need to include a press release with the AWF logo.
- 4.5 Whenever possible, an AWF banner should be on hand and set up to serve as a backdrop for TV and photo purposes.

## 5 PRESS VISITS

- 5.1 When appropriate, journalists should be invited to visit the project funded by AWF, accompanied by representatives of the AWF or the AWF Focal Point in the respective authority / government of the grant recipient.

## 6 VISITS BY GOVERNMENT OFFICIALS, AWF DONORS

- 6.1 Visits to projects by government officials and AWF donors are encouraged. Those should be prepared in coordination with the AWF and the AWF Focal Points of the host government. This can include meetings with local beneficiaries.
- 6.2 These visits may also include government officials and AWF donors' participation to roundtables and other events, as relevant.

## 7 LEAFLETS, Brochures and Newsletters

- 7.1 All leaflets and brochures relevant to the project/program financed by AWF should incorporate the basic elements of the AWF visual identity, i.e. the AWF logo -with or without tagline.
- 7.2 Leaflets and brochures produced by a grant recipient must also incorporate a definition of the AWF (boilerplate text).
- 7.3 The cover page of all documents pertaining to the project financed by the AWF must clearly identify the activity as being part of an AWF-funded activity.
- 7.4 Copies, including electronic copies of the publications, should be made available to the AWF.

## 8 ELECTRONIC Communication

- 8.1 Electronic communication disseminating information on AWF-funded projects including websites, newsletter, and social media platforms, should link to the AWF website.

## 9 SIGNAGE

- 9.1 The grant recipient should produce display panels, posters or banners to promote their AWF-funded or AWF-related activities at exhibitions and other events, placed in strategic locations for all to see.

## 10 Vehicles, Supplies and Equipment

- 10.1 AWF generally requests that vehicles, supplies and equipment funded by AWF be clearly identified, and visibly carry the AWF logo and the phrase "Provided with the support of the African Water Facility" in English, French or Portuguese, as relevant.
- 10.2 This requirement is subject to negotiation between AWF and the grant recipient as some supplies and equipment may be exempt.
- 10.3 The grant recipient must provide evidence of compliance with this rule (digital photos sent by email are recommended.)

## 11 Photographs and Audiovisual Productions

- 11.1 Professional high resolutions (300 Dpi) digital photographs of the project funded by AWF should be supplied to the AWF throughout the different phases of the project, to document the progress of actions and events related to these, and to be used in print and online publications.

11.2 All photos should be submitted with full caption and credit information.

11.3 The AWF will be entitled to use or reproduce photos submitted to it without payment of royalties.

11.4 Whenever relevant, audio-visual materials should acknowledge AWF support, by featuring the AWF logo at the beginning and/or end of the movie/documentary.

11.5 Copies of the movie(s) / documentary (ies) should be supplied to the AWF.

## 12 Commemorative Plaques or SIGNAGE

12.1 Whenever relevant, the grant recipient should place a permanent plaque, or some other type of large, commemorative signage on the most visible part of the building, infrastructure or nearby the project site, which received funding by AWF, beside the name of the Implementing Agency and/or name of the project, for visitors to see.

12.2 When appropriate, the plaque or signage could contain the following sentence: "This [name of the infrastructure] was funded by the African Water Facility" alongside the AWF logo.

## 13 Promotional Items

13.1 Before taking any decision on the production of such items, the Communication Officer at the AWF should be consulted.

13.2 Promotional items bearing the AWF logo can be distributed to support communications activities related to the project funded by AWF. This may include T-shirts, caps, pens, notebooks, USB keys, etc.