1.2.1.1 Summary sheet for rainwater harvesting

WATER PROJECT SHEET: Rooftop Rainwater Harvesting Technology

Brief Project description
The collection of rainwater by using rooftops as catchment areas can help reduce the use of treated water for secondary purposes, thus preserving water resources destined for primary purposes (e.g. drinking water).

Results Oriented Framework

Overall Goal
i. Conservation of water resources
ii. Raising awareness of the need to conserve water

Development Objectives
At least 25,000 residential housing units should be able to install rainwater harvesting systems in the first year of the project

Inputs
i. Source or offer rainwater collection systems suitable for residential, commercial and industrial buildings.
ii. Demonstrate the effectiveness of the system
iii. Promote the commercialisation of the technology

Outputs
i. Small scale enterprises should offer the systems and installation service
ii. Awareness of the national benefit is raised

Impacts
I. Alleviate water demand
II. Reduction in wastage of potable water
III. Increase in groundwater recharge.

Estimated costs
MUR 2,500,000 – for purchase and installations only.
A simple complete unit of RWH costs around Rs. 10,000 and this will require an installation cost of Rs. 1000. In the first year and a maintenance cost of Rs. 100 as from the third year since installation. The life span of a complete RWH unit is around 20 years. There are 250,000 housing units which can be targeted.

Proposed timeframe
2 YEARS (primarily to stimulate market uptake)
But 10 years to reach all potential housing unit.
The project will span over 10years, starting with housing units located in high rainfall regions, 25,000 units targeted each year.

Executive bodies
Ministry of Energy and Public Utilities

Cost-benefit analysis
The estimated benefit-to-cost ratio of 1.37 demonstrates a good return on investment. This technology will, in addition to ensuring an optimal use of treated water, contribute to enhancing groundwater recharge, thus reducing the surface runoff which is lost to the sea.

Risks
- Rainfall varies over space and over time, and some areas are dry. Such areas need to be investigated for the viability of the project.
- The public may be resistant to retroffing an existing system which will involve adding a RWH.

Expertise required (based on market maps)

Profile
Local expertise in water systems usage and dissemination.

Key tasks
- Identify critical areas for, and facilitate participatory workshops
- Identify adequate media to reach the different targeted groups

Identification of key stakeholders
Ministry of Energy and Public Utilities
Ministry of Finance & Economic Development
Ministry of Education and Human Resources
Ministry of Agro-Industry and Food Security
Ministry of Environment and Sustainable Development
Ministry of Health and Quality of Life
Private businesses involved in the marketing or development of RWH

1.2.1.2 Project overview

The rainwater harvesting technology is aimed at residential level, a roof top rainwater harvestor, with a simple design. The main features consisting of the collection system (pipe and gulleys), the connecting pipe with an outflow for discharge of settleable solid particles, a container (500litres), and an overflow with drainage facilities, in the form of absorption pits, in order to promote groundwater recharge.

• Project Scope and Possible Implementation

The project itself is based is based on the use of a simple system, which require low level of skills to install, operate and maintain. It is practically feasible, being relatively easy to handle. Rainwater Harvesting is not a completely new technology is Mauritius; it has been implemented both at residential and commercial level, but mostly on a voluntary basis. To date, the level of implementation of RWH is very low. With increasing water demands, the country's water sector is under much pressure and this calls for a change in mindset. Recent studies linked to sustainable development such as the Sustainable Consumption and Production project, the Maurice Ile Durable project and the Working group on water from the MRC, have recommended the use of RWH at residential level for a more optimal use of potable water.

• Timelines

There are about 250,000 housing units in Mauritius and the objective is to get most of these units, who are able to, set up a RWH. The timeline for achieving this objective is 10years, as the Government will need to identify funds in order to provide financial support in the form of soft loans.

• Budget/Resource requirements

A simple rainwater harvestor has been estimated at around Rs. 10,000 for a complete unit. It is expected that the Government will provide financial support, either up to a maximum of Rs. 8000. Or up to 75% the total cost, whichever is the lowest.

• Goals and objectives

The project is aiming at encouraging inhabitants to use rainwater for secondary purposes such as watering or cleaning. In addition the inhabitants will be made aware of the individual responsibility in the sustainable consumption of water resources.During very wet periods, excess rainwater will then be channelled in an absorption pit and this will promote groundwater recharge.

• Components

Collection system from the roof, pipe connections to the storage tank allowing for a scour to remove trapped dirt, a storage tank 500litres capacity, an absorption pit and necessary simple accessories.

1.2.1.3 Project framework

Project Goal: Adaptation to climate change by diversifying the source of water supply.					
Development objective: To remove barriers for the large-scale diffusion of rainwater harvesting technology at the household level using a market-based mechanism supported by incentives.					
Project Component	**Expected Outcomes**	**Expected Inputs**	**Expected Outputs**	**Objectively Verifiable Indicators**	**Expected Impacts**
1. Regulations for a robust RWH	Specifications of a RWH	Technical details of size of tank, pipe connections and size of absorption pit.	Ensure that RWH complete system will be reliable for at least 10years.	Quality of materials used for the construction of the system.	Residents are protected against frauds.
1. Develop a Scheme at the level of the concerned Governmental Institution to provide financial and technical support.	Eligibility for this financial support and ceiling.	Details about cost of RWH units availability on the market & details about owners of housing units.	Control to ensure that owners who can implement such system benefit through this scheme.	Monitor the application process.	Financial scheme achieves its objectives.
3. Monitor the implementation of this unit at Residential level through water bills.	Highlight the benefits of RWH at individual and national level.	Water Bills details from CWA.	Drop in water consumption over time.	Individual Water consumed over time & water consumed in the residential sector at national level.	Reduction in potable water consumed at both individual and national level.

1.2.1.4 Project Justification

• Relationship to the country's sustainable development priorities

The implementation of RWH at residential level is very low to almost inexistent. RWH is a simple technology which requires low level of technical input and provides sound benefits to the water sector. Mauritius is already witnessing the impact of climate change with extreme events such as long dry periods and flood type rainfall. RWH will also help in changing the mind-set of the inhabitants towards optimal use of potable water.

• Relationship to existing national strategies and plans or reports and assessments under relevant conventions, if applicable:

The updated Building Act (2011) has stressed on the need for sustainable consumption of water. New regulations in terms of Building rating is expected to be promulgated in the very near future and RWH is likely to contribute towards the good practice expected.

• Project Deliverables

RWH will help to alleviate some of the stress on the water sector and contribute towards the reduction in surface losses. A cost benefit analysis has confirmed the viability of this project in the Mauritian context.

1.2.1.5 Monitoring and Evaluation (M&E)

Monitoring of the impact of this activity can be carried out by the following:

1. Change of water consumed by the residents who have implemented a RWH;

2. Change of water demand in the residential sector by the Central Water Authority; and
3. Change in groundwater level in those areas, will indicate whether this technology is enhancing groundwater recharge.

1.2.1.6 Risks and their mitigation

Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

Risk	Level (Low, Medium, High)	Response
Climate Variability – long wet or even long dry periods	Medium	Sensitization campaign to emphasize on optimal use of potable water and behavioural change.
Low level institutional support responsible for providing guidance	High	Dedicated staff will be needed at the level of the institution.

1.2.1.7 Stakeholder mapping

Identify key stakeholders involved in the project including the private sector, civil society organisations, local and indigenous communities, and their respective roles, as applicable:

Stakeholder	Roles and responsibilities
Ministry of Finance and Economic Development	To provide soft loans and ensures that the loan is used for the stated purpose
Ministry of Industry, Commerce and Consumer Protection Ministry of Business, Enterprise and Cooperatives	To provide the enabling framework in terms of contacts, training and visibility, in order to encourage small local business to join the market.
Ministry of Environment & Sustainable Development	To promulgate appropriate legislation in order to protect the interest of the general public.
Central Water Authority & Water Resources Unit, Ministry of Energy and Public Utilities	To monitor that provision for groundwater recharge has been taken into consideration in the design.
Media	To sensitise the general public towards sustainable development and consumption of water resources, water security and impacts of climate change.

1.2.2 Project Ideas for Desalination

The desalination technology is increasingly being implemented in many parts of the world. This technology provides for an alternative source of water which is independent of rainfall. In Mauritius some 10 hotels located along the coastal zones have implemented small capacity reverse osmosis desalination plants, mostly to alleviate water problems during the dry period. The cost of water produced using the desalination plant becomes an attractive option when the hotels have to buy water from tankers. The Government is encouraging the hotel sector to implement this technology in order to alleviate the stress of water sector of the island.

There has been many developments in the technologies of desalination in order to lower the cost and to lower the energy consumption. The present report refers to the reverse osmosis desalination technology. This particular technology is bought off shelf together with the technical support. In order to successfully implement this technology there is a need to train technicians to provide the support needed during the operation and maintenance of the system. The EPA (2011) requires that an EIA report be submitted for a desalination plant and in August 2012,