



Integrated Water Resources Management Planning Approach for Small Island Developing States

GUIDELINES, METHODS AND TOOLS

Integrated Water Resources Management
Planning Approach for
Small Island Developing States

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Published by the United Nations Environment Programme in February 2012

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ISBN: 978-92-807-3254-2

Job Number: DEP/1506/N

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Citation

For bibliographic purposes, this document may be cited as:

UNEP, 2012. Integrated Water Resources Management Planning Approach for Small Island Developing States. UNEP, 130 + xii pp.

Lead Author: Vasantha Chase

Contributors: Deborah Bushell and Luvette Louisy

Technical Editors: Thomas Chiramba (Freshwater Ecosystems Unit, UNEP), Doris Mutta (Nairobi Convention, UNEP) and Elizabeth Khaka (Freshwater Ecosystems Unit, UNEP)

Manuscript and Production Editor: Daisy Ouya

Design and Layout: Conrad Mudibo, Ecomedia Ltd, Kenya

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Foreword

The world's Small Island Developing States (SIDS) - located in the Caribbean Sea and the Pacific, Indian and Atlantic Oceans - have unique ecological, geographical, hydrological, economic and cultural characteristics. SIDS are renowned for their natural tropical beauty, and a good number of SIDS' economies are built around tourism, a major consumer of freshwater. Typically with small land masses, small populations and a narrow base of livelihood options, most SIDS lack the economic, institutional and human-resource capacity of larger countries with broad-based economies. SIDS are also particularly vulnerable to the impacts of climate change, which include extreme weather and sea-level rise.

Integrated Water Resources Management (IWRM)—the systematic process of sustainably developing, allocating and monitoring the use of water resources in the context of social, economic and environmental objectives is key to development in SIDS. Successful IWRM approaches for SIDS must take into account these special characteristics, as well as local cultural and social contexts.

To this end, an extensive suite of resources for IWRM is available. Among these tools are the Global Water Partnership Toolbox for IWRM and the UNEP Handbook on the Development and Implementation of National Programmes of Action for the Protection of the Marine Environment from Land-based Activities.

This Resource Book makes the case for IWRM Guidelines specific to SIDS, and argues that unlike traditional models, SIDS desiring to implement IWRM need not start with expensive and time-consuming institutional reforms. They can start small, using pressing water-related issues as “entry points”, and fine-tuning their IWRM strategies from experience. This pragmatic approach towards sustainable water management promotes co-ordinated development and management of water, land and related resources without compromising the sustainability of vital ecosystems.

The publication contains numerous case studies of best practices of IWRM in SIDS, and a practical and logical framework of activities at various levels—national, watershed, and community. It puts forward a SIDS IWRM Planning Cycle and Methodology, a framework with three important pillars: stakeholder participation; continuous sensitisation and public awareness; and the creation of scenarios.

This publication will complement existing IWRM initiatives in SIDS. It will serve as an inspiration and practical guidance tool for those concerned with water planning and management, including coastal zone management practitioners; representatives of public-sector agencies in the water sector; organizations dealing with watersheds and catchments; and community groups interested in improving the quality and quantity of water in their locality.

Water is life. In the face of a burgeoning global population and climate-change-related weather variability, the urgency of rational and sustainable management of the planet's water resources, including on the SIDS, is today as keen as it ever was.

Ibrahim Thiaw
Director, Division of Environmental Policy Implementation
United Nations Environment Programme (UNEP)

Executive Summary

Integrated Water Resources Management (IWRM), which draws its inspiration from the Dublin Principles¹, is a systematic process for the sustainable development, allocation and monitoring of water-resource use in the context of social, economic and environmental objectives. The three pillars of IWRM as described in the Global Water Project's GWP-TAC (2004)² are:

- Moving toward an *enabling environment* of appropriate policies, strategies and legislation for sustainable water resources development and management;
- Putting in place the *institutional framework* through which the policies, strategies and legislation can be implemented; and
- *Setting up the management instruments* required by these institutions to do their job.

An extensive suite of tools for IWRM is already available. These include the *Global Water Partnership Toolbox for IWRM* and the *UNEP Handbook on the Development and Implementation of National Programmes of Action for the Protection of the Marine Environment from Land-based Activities*. There is also a body of knowledge that has been generated through the EU Directives emanating from the 6th EU Framework Programme. The “*New Approaches to Adaptive Water Management Under Uncertainty*” (*NeWater*) project, conducted between 2005 and 2008, was an integrated project co-funded by the “Global Change and Ecosystem” sub-priority of the 6th EU Framework Programme. The major goal of the project was to develop a theoretical and practical framework to support the transition of existing water management regimes towards greater adaptivity. Based on this framework, specific approaches and tools have been tested and further developed for practical applications in various river basins. Another suite of tools and methods has been developed through the *EMPOWERS Approach to Water Governance*³.

However, despite the vast array of tools and guidelines, no comprehensive IWRM guidelines/methodologies currently address the special characteristics of Small Island Developing States (SIDS). For instance, existing guidelines do not take into account the particular geographical and hydrological characteristics and vulnerabilities of SIDS. On small islands, the whole landmass is a wraparound coast, and the frame of reference for IWRM in SIDS must encompass the entire watershed and its receiving waters. In addition, the whole island is a system of highly integrated ecosystems and sub-ecosystems such that any intervention within a hydrological system must consider the impact of the intervention on the whole hydrological system.

In addition, there is the question of whether the governance systems, the management capacities, and the types of financing required for traditional IWRM are actually culturally and politically sensitive to the needs of developing countries, particularly SIDS. The successful implementation of classic IWRM plans requires SIDS to perform significant institutional and legislative reforms. This process calls for the establishment of a reformed institutional structure that involves decision-makers at the highest political level, from ministries, agencies, local administrations, the civil society, NGOs, private sector, and other actors concerned with the management of water resources.

SIDS require a critical mass of institutions, (including foreign missions, education and health services and police) to exist as a “State”. Consequently, a SID's public-service human resources are often spread very thinly across government institutions. Putting in place a strategy development

1 Solanes, Miguel and Fernando Gonzalez-Villarreal, n.d. The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management. GWP, TAC.TAC Background Paper No. 3

2 GWP Technical Committee: Tools for keeping IWRM strategic planning on Track.

3 The EMPOWERS partnership is a group of organisations and individuals committed to improving water governance and, more particularly, the rights and long-term access of disadvantaged social groups to reliable water supplies. The EMPOWERS partnership is developing a process methodology, practical tools and knowledge for improved participatory water resource management and water service provision at the local level; that is, at and between governorate/district and end-user levels.

process involves additional costs, including those associated with reform of laws and institutions, engaging civil society and the private sector in the strategy process, and developing new skill sets. The vast majority of SIDS simply do not have the necessary resources to reform their water sector while maintaining all the other functions that they have to in order to function as States. Unless funding is available from external sources to undertake the reform of the water sector, limited national budgetary resources will not be allocated for a major undertaking such as the reform of the water sector. In many instances such a reform may also not be politically expedient.

UNEP, in partnership with the Global Environment Facility, is therefore keen to develop an IWRM methodology which will reflect the unique geological, bio-geographical, socio-economic and cultural attributes of SIDS and take into consideration the need to conceptualise IWRM within the framework of an entire watershed stretching from the ridge to the reef. The objective of the intervention is to develop a globally applicable resource book for developing and implementing IWRM for SIDS.

It should, however, be noted that each of the SIDS regions, particularly the Pacific and Caribbean regions, has also adapted its own toolkit for developing IWRM. The Pacific Islands Applied Geo-science Commission, for instance, has developed a wide range of IWRM toolboxes. These toolboxes have been designed to provide important material on the different aspects of IWRM planning and implementation. The *Integrating Watershed and Coastal Area Management* (GEF-IWCAM) project in the Caribbean has developed a checklist of the steps required in the development of a national integrated water resources management plan, and the actions/requirements to develop the IWRM plan. All of these, however, are based on the GWP Tool Box and Guidelines, the core of which is reform of governance of the water sector.

The GWP's premise⁴ is that problems are aggravated by shortcomings in the management of water. Sectoral approaches to water resources management have led to the fragmented and uncoordinated development and management of the resource. Moreover, water management is usually left to top-down institutions, the legitimacy and effectiveness of which have increasingly been questioned. Thus, the overall problem is caused both by inefficient governance and increased competition for finite resource. Consequently the important elements of the GWP IWRM framework are the enabling environment, the institutional roles, and the management instruments. These three elements speak to improving governance of the entire water sector.

Unfortunately, by making institutional reform a prerequisite, IWRM proponents put the initiation of IWRM principles beyond the reach of SIDS. Experience shows that the paradigm for SIDS has to acknowledge that initial major reforms in water governance are not a prerequisite for IWRM or for catalyzing change in the water sector. First steps that can easily be implemented are often enough to begin the process of moving towards more sustainable water development and management.

There has also, until recently, been a pre-occupation with the river basin or large catchment being the most sensible unit for IWRM. While certainly some functions are best handled at this scale, the second Dublin principle speaks of acting at the lowest appropriate level; much water management has to happen at far more local levels⁵. Additionally, while basin-level IWRM by representative bodies in which all stakeholders are fully and fairly represented is a good target, or endpoint, a strength of the IWRM paradigm is that real and significant improvements in water management can be made at all levels—from the household to the international basin—by individuals and institutions applying the Dublin principles in the context of their own abilities and opportunities⁶.

4 GWP Technical Advisory Committee, 2000. TAC Background Paper Number 4. Integrated Water Resources Management

5 Blomquist, W., Dinar, A., Kemper, K. 2005. Comparison of institutional arrangements for river basin management in eight basins. Policy, Research working paper 3636. <http://econ.worldbank.org>

6 Moriarty, P.B., Visscher, J.T., Bury, P. and Postma, L.. 2000. The Dublin principles revisited for WSS. 26th WEDC Conference Water, Sanitation and Hygiene: Challenges of the Millennium, Dhaka, Bangladesh. www.lboro.ac.uk/departments/cv/wedc/conferences/26contents.htm

The experiences gained from the implementation of SIDS indicate that IWRM for SIDS is a pragmatic approach towards better and more sustainable water management: it is a **process** which promotes the co-ordinated development and management of water, land and related resources, without compromising the sustainability of vital eco-systems; it is *not* a time-bound plan to guide a country in using and managing its water resources with clearly identified goalposts and milestones. Furthermore, IWRM for SIDS does not mean that all actions have to be fully integrated and handled by a super-agency that replaces the many actors in water; rather, it is about stakeholders finding ways to coordinate and address coordination problems in the management of water resources.

This Resource Book provides a series of case studies from each of the three SIDS regions (Caribbean, Pacific, and Atlantic & Indian Oceans), and a conceptual framework for the SIDS IWRM methodology. In doing so, the book makes a case for IWRM Guidelines specific to SIDS and uses examples and case studies from SIDS to explain the SIDS IWRM Planning Cycle and Methodology. It also provides guidelines for incorporating the gender, and the ecosystems approaches into the SIDS IWRM Planning Cycle. There is also a section on climate change and vulnerability, and a framework for incorporating monitoring and evaluation indicators into the Planning Approach. The Resource Book also contains a tool kit of the different methodologies that are incorporated into the SIDS Approach; and examples of templates and methods that have been determined to be best practices arising from IWRM experiences in other SIDS. A comprehensive bibliography of relevant books, reports and documents on IWRM, on the methodology and tools for the SIDS IWRM Approach is provided.

The Resource Book was discussed and finalised at a review meeting held in Saint Lucia from 24–26 August 2010. Participants at the meeting were from the three main SIDS regions. The comments and recommendations from this workshop have been incorporated, as appropriate, into the Resource Book.

About this Resource Book

What this Resource Book sets out to do

This Resource Book provides a suite of case studies of Integrated Water Resources Management (IWRM) approaches in small island developing states (SIDS) around the world, and based on those experiences, describes a practical and logical framework of activities for the planning, development and implementation of integrated water resources management/integrated water development plans at the national level, at the level of watersheds and at the level of villages and communities. It advocates collaboration and dialogue between all stakeholders involved in solving a problem whose solution will contribute to improving the management of the water sector at the macro, meso, or micro level. The stakeholder dialogue and consultation requires creating time, space, and institutional platforms for interaction within a specific geographical area, between those who have a stake in the water resources and those who provide the services.

There are three issues that are core to these Guidelines: **Stakeholder Participation; Continuous Sensitisation and Public Awareness; and the Creation of Scenarios** for looking at different pathways to solving problems. The process of participatory analysing, visioning and strategic planning is at the heart of this Resource Book, as is also observed in the numerous IWRM interventions in SIDS.

Who should use this Resource Book?

The Resource Book is relevant to all those concerned with tackling integrated water resources management, including coastal resources and coastal zone management (especially as they relate to pollution and waste water management). It is also relevant for those who would like to be familiar with what is going on with IWRM in SIDS in various regions of the world, and those wishing to initiate and facilitate a change process in water resources planning and management in SIDS. The guidelines, methods and tools described are based on experiences and best practices from SIDS. Their application will help to achieve necessary changes in water resources management, particularly if those leading the process have a high level of technical and facilitation capacity. Of course, the Resource Book will be most effective in the hands of people with skills and commitment.

The Resource Book can be used by representatives of public sector agencies who are involved in the water sector; by groups in a watershed or catchment; and by community groups at the village level who are interested in improving the quality and/or quantity of water they receive. What is important is that the process has to be consultative, it has to include all the stakeholders and it must lead to attaining a developmental goal, be it at the national, watershed or community level.

While the Guidelines contained in this Resource Book have not been tested, there is no reason to believe that the approach is not suitable, as long as the persons involved are committed and the financial resources to undertake the interventions are available. Most components of the guidelines (i) are derived from experiences and best practices in SIDS; (ii) are adaptations of well-proven methodologies from the field of project management and strategic planning; and (iii) build on previous guidelines for IWRM by the GWP and the EU, SOPAC, IWCAM/CEHI, UNDP, FAO and the UN.

Experience shows that the paradigm for SIDS has to acknowledge that initial major reforms in water governance are not a requisite for IWRM and for catalyzing change in the water sector. First steps that can easily be implemented are often enough to begin the process of moving towards more sustainable water development and management.

The SIDS IWRM Planning Approach explicitly builds gender considerations into IWRM initiatives, which can increase the effectiveness and efficiency of any water resources management intervention. Also integral to the SIDS IWRM Approach is the Ecosystems Approach, a strategy for the integrated management of land, water, and living resources that provides sustainable delivery of ecosystem services in the hydrological cycle, in an equitable way. Most importantly, the approach relies on collaborative decision-making by all relevant stakeholders and users that may, and often do, have different values, conflicting interests, and capacities to understand and manage these systems.

The Resource Book provides IWRM templates developed and used by SIDS, and a comprehensive bibliography of the relevant books, reports, and documents on IWRM and on the methodology and tools for the SIDS IWRM approach.

Abbreviations and Acronyms

AM	Adaptive Management
CEHI	Caribbean Environmental Health Institute
EMPOWERS	Euro-Med Participatory Water Resources Scenarios
EU	European Union
FCC	Facilitating and Coordinating Committee
FSP	Full Size Project
GEF	Global Environmental Facility
GIWA	Global International Waters Assessment
GWP	Global Water Project
IWCAM	Integrated Watershed and Coastal Areas Management
IWP	International Waters Programme
IWRM	Integrated Water Resources Management
KAPB	Knowledge, Attitudes, Perceptions and Behaviours
MDG	Millennium Development Goals
NAWB	National Apex Water Body
NIC	National Inter sectoral Committee
PICS	Pacific Island Countries
PRSP	Poverty Reduction Strategy Paper
SIDS	Small Island Developing States
SMART	Smart, measurable, achievable, realistic, time-bound
SOPAC	Pacific Islands Applied Geo-science Commission
STEEP	Social, Technological, Environmental, Economic and Political
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WPSC	Water Policy Steering Committee
WSP	Water Safety Planning
WSSD	World Summit on Sustainable Development
WUE	Water Use Efficiency

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SECTION 1

Water Resources Management in Small Island Developing States

Introduction

Freshwater is becoming increasingly scarce around the world, and more so in small islands, which are more vulnerable to climate change impacts and ecosystems degradation than larger, mainland countries.

For Small Island Developing States (SIDS), the issue of freshwater resources faces many of the problems experienced in developing countries, such as inadequate technical and financial capacity. However, small islands have additional unique physical, demographic and economic features that contribute further to the vulnerability of their water resources. These include relatively limited surface area and natural-resource bases (arable land, freshwater, mineral resources, and conventional energy sources); greater sensitivity to natural disasters such as typhoons, hurricanes, cyclones, earthquakes, volcanoes; and isolation from mainlands.

Because of their small size, the impact of the surrounding sea is more pronounced on small islands than on larger islands and mainlands. Changing climate and the threats posed to water security on account of sea-level rise and saline intrusion of coastal aquifers, rainfall variability and reduced catchment recharge, coupled with increased frequency of natural disasters, present serious challenges to the management of water resources on small islands (Box 1).

Many SIDS are already experiencing varying degrees of water-related challenges. For instance, by 2025 Mauritius is projected to become a “water-stressed” country, and Comoros a “water-scarce” country. In response, many SIDS are now mandating rainwater harvesting to meet water demands. In Bermuda and the US Virgin Islands, for example, all new buildings must harvest enough rainwater to serve their residents.

In addition, many SIDS are facing tremendous pressure from population growth, which results in intense competition for land and water resources, as well as ecosystems degradation. In some SIDS, particularly those in the Caribbean, demographic changes coupled with growing levels of development and urbanisation are exerting increased pressure on natural resources. What’s more, the centres of high population and economic activity in SIDS are typically at or near the coast, on vulnerable, low-elevation land.

These factors combined threaten both the quantity and quality of available water resources in SIDS for the medium to long terms.

A case in point is the Seychelles, where most water comes from rivers. Precise figures are not available but in 1998, water shortages were so severe, partly because of the extreme El Niño weather event, that the brewing and fish-canning industries were forced to close. Mahé in the Seychelles is under increasing threat of water shortages as a result of wilt disease that is damaging a tree species, *Pterocarpus indica*, that is important for ecosystems functioning and watershed management.

Water supply in the Comoros on the islands of Grande Comore, Mohéli and Anjouan is threatened by saline intrusion into many of the coastal boreholes.

Box 1. Special Characteristics of Small Island Developing States

- Small size – limited natural resource endowment; high import content.
- Limited institutional capacity and small manpower resource base.
- Limited scope for economies of scale
- Demographic factors: out-migration resulting in brain drain; rural-urban pull resulting in population concentrations in narrow coastal strips.
- Insularity and remoteness, leading to high transport costs.
- Proneness to natural disasters, which threaten the survival of some small islands; large damage per unit of area and costs per capita.
- Unique and fragile ecosystems with low level of resistance to outside influences.
- Entire island is a system of highly integrated ecosystems and sub-ecosystems.
- High vulnerability to the impact of global warming and rising sea level.
- Over-dependence on donor funding for capital projects.
- Access to funding is limited.

Making the Case for IWRM Guidelines for SIDS

The myriad challenges and gaps that exist in integrated water resources management (IWRM) in SIDS are, admittedly, also found in other developing countries. Where SIDS differ from other countries is in the immediacy of these problems, and their limited capacity to respond. With limited land mass and even more limited natural water resources, the pressures of economic development coupled with climate change and associated climate variability make water shortages, flooding, soil erosion, chemical pollution and salination a present-day reality for users in all sectors (Box 2). These pressures and demands are now close to exceeding the natural carrying capacity of the islands and watersheds in some SIDS, especially those hosting cities with high population densities.

Small Island Developing States need to act now to address these issues, but are hampered by small populations which limit the amount of technical capacity in-country, as well as the low economic base from which to finance mitigation measures. In such situations, IWRM as defined by the GWP— a framework within which there may be a need for significant changes in existing interactions between politics, laws, regulations, institutions, civil society, and the consumer-voter— is probably not the ideal way to use the existing but limited capacity and funding within SIDS to the best effect.

For instance, in SIDS the capacity to make changes in the framework does not have to begin with changes in governance or with creating an appropriate enabling environment (institutional and administrative framework). Neither does it have to begin with the formulation of an IWRM and/or Water Efficiency Plan. This is borne out by the number of SIDS that have not completed IWRM and Water efficiency Strategies/Plans; they simply do not have the resources to do so. Furthermore, for those island States that have been able to complete the IWRM plans with external funding, the bottleneck is in implementing the plans, which requires substantial financial resources and technical capacities. This is also true for most of the other developing countries that have formulated IWRM and Water Efficiency Plans with external funding and technical assistance; they find themselves stranded, with neither the funds nor the expertise to implement the Plans.

Box 2. Barriers to Water Resources Management in SIDS

1. Lack of integration between sectoral water-related policies, which leads to fragmented programs and inefficient utilization of technical capacities and financial resources.
2. Lack of decentralization and efficient local administrative structures, coupled with low capacity in end-users, which minimise the opportunities to operationalise IWRM at the grassroots level.
3. Many SIDS have traditional or customary systems of land tenure, poor land use and management practices, and inadequate land-use policies, which continue to impact on their water resources. Traditional values, beliefs and rights, if not adequately considered, can become significant, if not insurmountable, barriers to any forms of water and land management. The most obvious of these is the issue of customary land ownership, and the associated rights of land usage, access, purchase and even water usage. Whilst many of these conflicts can be resolved, usually through extensive community engagement, these approaches rarely coincide with the shorter timescales associated with implementation of interventions.
4. The prevailing erroneous notion that the provision of water is a social service, and not an economic good and vital ingredient for national development .
5. There is often no coordination between various authorities with respect to data collection and management, resulting in inefficient utilization of available technical and financial resources. Decisions are also often made without using the data that is available, because the data has not been analysed and interpreted.
6. The existing water strategies and policies require investments that are not affordable by many governments of SIDS; many island governments face difficulties in allocating the necessary budget to finance the operation and maintenance of the water infrastructure.
7. Where available, water-related legislations are often inadequate, technically inappropriate, and/or unaffordable. The inadequacy of legal and regulatory frameworks also makes it difficult to apply economic instruments such as the “polluter pays” principle (such as fines associated with excessive pollution loads) or incentives for good practices.

A 2008 status review of IWRM and Water Efficiency Plans in Selected SIDS reveals that in a sample of 13 Caribbean and Pacific SIDS, only Samoa had an IWRM Plan in place; nine of the countries were in the process of preparing the plans, and one country had taken initial steps towards formulating the plan. All the countries showed that they had undertaken diagnostics of the water sector and identified major hot spots. Many had also identified and implemented demonstration projects based on a further evaluation of the hot spots. A recent 2011 status survey revealed that most countries have made progress in adopting IWRM but implementation takes time and is slow. Countries like SIDS require significant support.

The experience of various SIDS and developing countries reveals that initial major reforms in water governance are not a prerequisite for IWRM or for catalyzing change in the water sector. This is supported by the finding of the 2003 GWP Survey. The survey indicated that those countries that

have made the most progress towards adapting and reforming their water management systems towards more sustainable practices have often started by focusing on addressing specific water challenges.

Moving from fragmented to integrated approaches in developing and managing water resources will require change, much of it difficult. However, IWRM approaches do not necessarily require making all these changes at once, nor do they imply starting in a broad-based manner. Indeed, IWRM approaches can often best be initiated by focusing on specific issues or problems which then become the “entry-points”. First steps that can easily be implemented, after the selection of an entry point, are often enough to begin the process of moving towards more sustainable water development and management. By addressing the most pressing key priority issues in each country, this approach is most likely to achieve political, institutional and general public support in the short term.

SIDS Experiences in Water Resources Management

The Caribbean SIDS

Caribbean countries occupy a region of the world in which providing adequate supplies of freshwater presents a substantial challenge to governments. In many countries, the annual per capita freshwater availability is far below the 1,000 cubic-meter threshold commonly used to measure scarcity.

Water in Caribbean SIDS comes primarily from surface (rivers, springs, ponds) and ground water sources, although there are variations from island to island in the proportions of ground-to-surface water abstraction and utilisation. Rainwater is harvested in some of the smaller islands and in islands where topographic constraints limit access to the public distribution systems in some locations. Desalination technologies are seeing increased application in the more water-stressed Caribbean islands where the demand for fresh water substantially surpasses the supply from natural sources.

Box 3. Jamaica: The Water Situation

Jamaica exploits over 400 ground- and surface-water sources, in a ratio of 84% to 16% respectively, with an estimated annual production of 940 MCM³. The public water supply operated by the National Water Commission supplies 72% of the population. While Jamaica has sufficient water resources to meet all demands, they are unevenly distributed in time and space. The present shortfall in supply is about 400 MCM³/year.

Source: Water Forum of the Americas: Report from the Caribbean

Box 4. Barbados: The world's 15th most-water-scarce country

Officials in Barbados are highlighting the importance of water resource management, as that island stands as the 15th most-water-scarce nation on earth and the 16th most-densely populated nation. These harsh statistics mean that Barbados must wholeheartedly embrace the concept of Integrated Water Resource Management (IWRM) as it seeks to uphold its mandate on water resources management. The country has developed a road map for IWRM. The adoption of IWRM principles places novel demands on policymakers, operators and water-users, but it also provides an opportunity for achieving comprehensive and efficient water resources management decisions that address the challenges of sustainable development.

Source <http://www.caribbean360.com/index.php/news/13549.html#ixzz1XqlyQsGo>

Box 5. Grenada: Some Water Resources Management Issues

An IWRM stakeholders meeting held in February 2007 identified the following issues related to water resources management in Grenada:

- Grenadians have a general perception that their water supply is infinite;
- Changing land use patterns, expanding urbanization and consequent changes in demand are outstripping supply capacity (in the context of existing infrastructure);
- Lack of a national water resources audit to ascertain the value of the resources;
- Weak planning capacity for water management following disasters such as hurricanes, flooding and drought;
- Deforestation, improper land development and poor agricultural practices as outcomes of inadequate land use planning/ zoning, which have a negative impact on the country's water resources;
- Inadequate storage capacity during dry season supply shortfalls;
- Lack of arrangements for transfer of payments (e.g. royalties) for water-source protection by private land owners;
- Rapidly increasing competing demands from the housing and tourism sectors that are outstripping supply capacity;
- Lack of coordination, cooperation and integration of stakeholders in utilization and management of water resources;
- Limited capacity for water sector development and related project planning, design and implementation;
- Absence of a comprehensive water resources management plan embracing all stakeholders; and
- Marginalization of women in water management and use.

Box 6. The Caribbean: The Drought of 2009–2010

- Saint Lucia declared a water emergency after its main reservoir's levels dropped more than six meters. Two schools and some courtrooms were closed because of dry taps. In Guyana, a grassroots women's organisation staged a protest and fundraiser for a water truck, while the Central Islamic Organization of Guyana organised its first-ever prayers for rain. In Jamaica, where the island's largest dams have been operating at less than 40% capacity, inmates at a maximum security prison protesting the lack of water started a riot that left 23 injured. Trinidad and Tobago enforced a strict water conservation law for the first time since 1998. In Barbados, crews battled more than 1,000 bush fires, nearly triple the number the previous year. The National Water Commission in Jamaica, already grappling with one of the worst droughts in the nation's history was bedevilled with an upsurge in incidents of water theft; illegal connections and vandalism; and death threats to employees.
- Caribbean Officials linked the prolonged drought to: (i) the El Niño weather phenomenon, (ii) climate change, (iii) poorly maintained and funded water distribution networks, and (iv) the related fact that dam and reservoir levels were down by record levels as rivers dried up.

Lessons Learned:

- Need for improvements in rainfall forecasting and monitoring
- On the Caribbean basin scale, rainfall indices gave reasonable notice to the existence and severity of the drought; it is however clear that national-level monitoring, incorporating other indicators (hydrological and agricultural), is also necessary
- Categories of rainfall indices should be better adjusted to suit potential impacts on the ground, based on the state of water resources and the socio-economic circumstances of the region
- A coordinated effort is needed between multiple stakeholders to develop an effective alerting system that should include:
 - An understanding of stakeholder needs and capacities;
 - Timely data collection and dissemination by multiple stakeholders across multiple sectors
 - Human capacity to process and interpret data on a timely basis
 - Collaborative and non-competitive working environment
 - Regular and effective communications between decision makers and technical staff
 - An effective system of protocols for issuing and communicating alerts to various stakeholders across various sectors.



Severe landslide in Dominica after rains returned in May 2010.

Source: David Jessop: caribenews.com

The development of national water policies is on-going in several Caribbean countries. Grenada, Jamaica and Barbados have relatively well defined operational policies on water. In Jamaica integrated water resources management is being promoted with the enactment of the Watershed Act and the implementation of a National Water Policy and Strategy. Saint Lucia has developed and is operationalising a comprehensive water management policy that takes into account management issues of coastal areas. In addition, Saint Lucia has established a Water Resources Management Unit and a Water and Sewage Commission. In Anguilla, freshwater management issues have gone largely un-addressed, as the government has not established regulatory measures, incentives or related decision making tools, although it has promoted the use of desalination and rainwater harvesting.

Despite the progress made, the Caribbean has a poor track record of water resources management within the watershed and with respect to groundwater supplies. The geography of Caribbean Small Island States, like other SIDS, makes them all watersheds. In fact, the nexus between the watershed and the coastal area is such that the impact of activities on one is felt on the other. Lack of appropriate management directly affects the sustainability not only of the water resource itself, but also the associated biodiversity in the watershed and coastal zone, and contributes to land degradation.

High population densities, combined with population growth, urbanization and increased development, particularly of residential buildings and tourist resorts, has led to the contamination of underlying aquifers and surface water, and the deterioration of coastal water quality. In an effort to mitigate this problem, the GEF-financed *Integrating Watershed and Coastal Area Management (IWCAM) in Small Island Development States* project is a intervention aimed at strengthening the commitment and capacity of the participating countries to implement an integrated approach to the management of watersheds and coastal areas. The project's long-term goal is to enhance the capacity of the countries to plan and manage their aquatic resources and ecosystems sustainably. The aim of the project is to demonstrate the development of an effective regional strategy for IWCAM, in parallel with demonstrating and replicating geographically targeted national solutions to common Caribbean SIDS issues, through a series of interconnected Demonstration Projects that capture best practices. The objectives of these projects in respect to the overall regional IWCAM project are:

- To target selected national and regional hotspots of watershed and coastal impacts and threats, as well as sensitive areas which are particularly vulnerable to similar impacts and threats;
- To deliver real and concrete improvements and mitigation to IWCAM constraints and impacts;
- To identify and mobilise reforms to policy, legislation and institutional realignment consistent with IWCAM objectives;
- To provide transferable lessons and best practices which can serve to replicate successes elsewhere, both nationally and regionally.

Some of the information from the demonstration sites is exhibited in Boxes 7 to 12. The information for these case studies was derived from *IWCAM Caribbean Waterways* Newsletters. Two examples, from Barbados and the Bahamas, are described in more detail below.

IWRM in Barbados

The Barbados Water Authority and the Coastal Zone Management Unit have taken the initiative to develop a “roadmap”, policy and plan for IWRM, whose implementation will involve a change in the way in which water resources are managed.

The IWRM plan calls for the existing sectoral system to be replaced with a greater degree of coordination between sectors, and for measures to be put in place to ensure that the management of water resources is more holistic. This will ensure that due consideration is given to the various potentially conflicting uses and allocations of water resources.

Such a system will need:

- A holistic and comprehensive national policy and plan for the management of water resources;
- A legal and regulatory framework for the management of water resources;
- Improvement, and, where necessary, development of the institutional and administrative framework for water resources management; and
- Enhancement of capacity and capability for the management of water resources.

The IWRM roadmap anticipates the following requisite steps:

- Building of political consensus and political will;
- Development and endorsement of a National Water Policy;
- Initiating mechanisms for cross-sectoral integration;
- Capabilities assessment;
- Review of legislation;
- Review of data collection, monitoring and assessment and the development of indicators.

IWRM in the Bahamas

The Commonwealth of the Bahamas suffers from frequent shortages of freshwater, a condition that is characteristic of many low-lying island nations around the world. Access to freshwater is essential for economic and political stability in the Bahamas, especially because tourism, a major stress on freshwater supplies, accounts for more than 60% of the country’s gross domestic product. As such, overall short-term economic growth prospects rest heavily on the fortunes of the tourism sector. Availability of freshwater resources in the face of increasing tourism demand and climate variability will be a critical part of the Bahamas economic sustainability.

To this end, with financing provided by NorthCom, the Government of Bahamas embarked on a project in 2010 to enhance and monitor its fragile water security. The project involves working with the Bahamian water management entities to deploy and maintain a groundwater and evapotranspiration monitoring network for key data parameters; developing a geospatial database for archival of historic and newly collected groundwater information; and developing the local capacity to maintain the infrastructure and interpret the results of the accompanying monitoring efforts.

In addition to the work undertaken through the IWCAM project, Caribbean SIDS are also involved in interventions financed from their national budgets. Trinidad and Tobago, for instance, has formulated an Integrated Water Resources Management Policy (see Box 13).

Box 7. Talvan Water Catchment Project: Best Practices for Public/Private Sector and Community Participation in Integrated Watershed Management in Caribbean SIDS

The Talvan catchment lies within a key agricultural area that has seen significant expansion in agricultural activity over the years. Livestock rearing is a relatively minor activity but there are at least three piggeries which are potentially significant contributors to pollution. Cattle are permitted to graze unrestrained and contribute to degradation through denudation of the riverbanks, physical soil disturbance and waste production. There has been significant urban expansion in the catchment in recent years.

Characteristics of Talvan catchment

- Northeastern side of St. Lucia
- Area of approximately 3.25 km²
- Most of it is privately owned
- Mixed agriculture
- Important source of water supply for the tourist-oriented wealthy north
- Poor water quality – soil and riverbank erosion
- Poor solid waste management and agricultural practices

In 1998, the farmers and other members of the community came together to address issues of:

- soil erosion along riverbanks through stabilization measures including short- and long-term bio-engineering measures and reforestation
- water pollution from solid waste and agro-chemicals through the establishment of vegetative wattles and buffer zones
- community education programmes
- river clean-up campaigns
- agricultural diversification – from banana to high-value tree crops

The success factors of the Talvern Catchment Project:

- Community empowerment, addressed through workshops, technical training sessions and exchange programmes with similarly established groups, both within and outside of Saint Lucia.
- Establishment of a technical advisory committee comprising of several government, public, and private agencies, farmers and landowners.
- Giving consideration in the short-term to the immediate concerns of the affected communities
- Early clarification of benefits/cost to participants
- Broader (national) recognition of the work of the group
- Building of technical capacity of members – reducing dependency of “outside” support

Box 8. Antigua & Barbuda: Mitigation of Groundwater and Coastal Impacts from Sewage Discharges from St. John's

McKinnon's Pond, north of the capital St. John's and in the same parish, is the site of the GEF-IWCAM Antigua and Barbuda Demonstration Project. St. John's has an urban population of 45,000, sixty percent of the country's total population. There are inadequate sewage handling and treatment systems in place. While the majority of households use septic tanks, these are not pumped regularly. This often results in septic failure and overflow, causing untreated effluent to go directly into drains. Most of this effluent eventually drains into the St. John's Harbour and impacts on nearby McKinnon's Pond, causing high levels of marine pollution.

The Demonstration Project aims to address the issue of coastal pollution caused by sewage and wastewater discharge from the parish of St. John's. It precedes an overall plan to identify a cost-effective solution to this problem for the St. John's watershed, and eventually the entire country, through the design and development of street-level or other appropriate systems to handle, primarily, domestic wastes.



Lower income, unregulated housing located along the edge of McKinnon's Pond

Source: GEF IWCAM Newsletter Caribbean Waterways Volume 2 Issue 3 Sept. 08

Box 9. Jamaica: Demonstration Project Closes with a Celebration of Community Empowerment

The Driver's River Watershed is rated one of the least degraded in Jamaica and was chosen to help develop Best Management Practices in environmental habits and activities, incorporating the lessons and experiences gained in other watershed management units and Small Island Developing States. These were identified, planned and implemented through a participatory process involving agency and community partnerships. Key to the success of this project was the formation of four committees (Governance & Enforcement, Sanitation & Sustainable Livelihoods, Environmental Monitoring, and Public Education & Awareness) to ensure the adaptation and implementation of these practices.

The Project also featured a Grants component which gave twelve communities the opportunity to design and implement a range of projects which addressed schools sanitation improvement, solid waste disposal, mangrove rehabilitation and protection of river and waterways, among other things.



Tree Planting Ceremony in the Driver's River watershed, Jamaica's IWCAM demonstration site

GEF IWCAM Newsletter Volume 3 Issue 4 December 09



Summer camp outing for the children on Driver's River Watershed

GEF IWCAM Newsletter Volume 3 Issue 4 December 09

Public Education and Awareness

A range of activities for students and adults designed to share interventions, create awareness and encourage environmental Best Practices was organized. In addition to tree planting ceremonies and summer camps, there were debating, essay and poster competitions; expos; and community outreach meetings (town meetings).

School Sanitation Facilities

Sanitation facilities (including toilets and wash basins) were built in several schools.



School sanitation improvement project in the Driver's River Watershed – Before the intervention

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School sanitation improvement project in the Driver's River Watershed – After the intervention

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Box 10. Dominican Republic: Mitigation of Impacts of Industrial Wastes on the Lower Haina River Basin and its Coast

The Lower Haina River Basin is one of the Dominican Republic's main industrial conglomerations, with over one hundred medium- to large-sized industries. The region is highly contaminated by these industries as well as the solid and liquid wastes generated by surrounding communities. Most industries lack an environmental component among their objectives. Final disposal of industrial waste is mostly carried out by third parties without environmental authorization, and difficulties in the management of toxic and hazardous waste are further exacerbated by poor capacity and infrastructure.

The Dominican Republic's GEF-IWCAM Demonstration Project aims to obtain tangible results in the reduction of pollutants in this hydrographic basin. The principal intervention is in the industrial sector, with the implementation of 'clean production' programmes to reduce contamination by developing recycling and re-utilisation mechanisms. The main expected results are a reduction in the pollution emitted by the industrial sector, improvements to water quality within the basin, and the creation of a sustainable management programme for the hydrographic basin.

Summary of the Demonstration Project's Impacts

- Attitude change amongst industries regarding the management of industrial discharge
- Improved communication between the industrial sector and the Ministry of Environment
- Improved integration between different parts of the Ministry of Environment and other governmental institutions in the execution of the project
- In the medium term, considerable improvement in the air quality and management of solid waste
- Students motivated to form the volunteer Nature Guardians and Environmental Defense Clubs; and neighborhood councils identified more with environmental issues
- Community involvement in work related to cleanup of the watershed increased
- Creation of synergies with other activities within the Ministry of Environment and Natural Resources, such as:
the construction of barriers to prevent dumping of solid waste in informal dumps in zones near the river and estuary; on-site stabilization of lead-contaminated soil from an old smelting plant and battery-recycling center; restoration of the wetlands in the lower Nigua; and declaration of that site as a protected area.



Solid waste disposal is a challenge; children play alongside garbage

*GEF IWCAM Newsletter
Volume 4 Issue 2 June 2010*

Box 11. St. Lucia: Demonstration Project Closes and The Trust for the Management of Rivers Takes Over



On 30 May 2010, the GEF-IWCAM St. Lucia Demonstration Project held its closing ceremony and officially launched the non-governmental organization called the Trust for the Management of Rivers (TMR).

The lively ceremony was a tribute to participants in the project as well as a symbolic handing over of responsibility from the Fond D'Or Watershed Management Committee (WMC)—the main participatory watershed management mechanism during project implementation—to the newly created TMR.

Due to concern by WMC members that beneficial activities begun during the project would not be sustainable, a series of consultations took place in 2009 to explore the best type of organizational structure for a group dedicated to continuing an integrated approach to the management of the watershed after project completion. This led to the formation of the TMR.

The TMR already has a mission statement and objectives, rules and regulations, and a Transitional Plan of Action. Its mission is: "To achieve recreational-water standards in the river through the promotion of improved land use practices throughout the watershed."

Its functions are:

- To provide leadership for river water management, research, education, etc.;
- To promote, establish and enhance partnerships;
- To develop coordinated river water quality efforts.

Box 12. Cuba: The Cienfuegos Watershed Demonstration Project Making a Positive Difference



Cienfuegos Bay

GEF IWCAm Newsletter Vol.3 Issue 1 March 09

Data from this GEF IWCAm-funded project is collected, analyzed and made available through a functional Geographic Information System (GIS) to a specially created local authority and other relevant stakeholders. In January 2009 their database, the Sistema Integral de Gestión de Información Ambiental (SIGIA) was introduced to stakeholders at the First Provincial Environmental Monitoring Programme meeting. This has resulted in significant strengthening of wastewater management as the Local Authority and linked institutions have a complete and updated inventory of point sources of

pollution in the area, along with an evaluation of contaminant loads.

In the agricultural and forest sectors, demonstration areas of best practice in land use and management are being implemented. On-going training activities are important aspects of these initiatives because it is recognized that replication of good practice at community level gives workers new environmental knowledge, increases production and helps protect fragile ecosystems.

The “14th July” sugar factory within the watershed is being used to demonstrate best land-use practices in agriculture. Water is recycled and consumption has been reduced. Sugar plantations are irrigated with sugarcane wastewater in a program on water quality for irrigation and soil conservation. Bio-waste is conserved and applied to the field, a practice that seems to be improving crop yields.



Soil conservation training for farmers in Cienfuegos Bay

GEF IWCAm Newsletter Vol.3 Issue 1 March 09



Pilot in the GEF-IWCAm Project in Cuba to demonstrate best agricultural practices.

GEF IWCAm Newsletter Vol.3 Issue 1 March 09

Box 13. Trinidad and Tobago: Integrated Water Resources Management Policy

A Water Resources Management Strategy study completed in January 2000 highlighted the need for the country to focus on the following issues:

1. The implementation of the concept of Integrated Water Resources Management (IWRM) to attain sustainable development of the nation's water resources
2. The need to establish an effective and financially autonomous institutional framework that facilitates efficient water resources management
3. Meeting the growing demand for water
4. The protection of environmental quality and ecological systems
5. The development of capacity and tools within the country to support planning and decision-making in IWRM and the operation of the water resources system.

The pressures on available resources and stakeholders' dependence on water have made water resources management (WRM) complex. The Government of Trinidad and Tobago is therefore pursuing modern scientific strategies for water resources management in which the water sector and the environment are considered in an integrated manner in relation to economic, technical, social and political considerations. The formulation of an National Integrated Water Resources Management Policy constitutes a major initiative in this endeavour. The policy, which is expected to form the basis for IWRM in the country:

- Provides an overview of the status of the country's water resources
- Outlines the goals and objectives of water resources management
- Outlines the principles which guide the policy
- Outlines priorities for the allocation of water
- Provides direction for the various water-related issues, including land-use planning; water resources assessment; water resources planning; abstraction licensing; designating uses of water bodies; ambient water quality; public water supply; agricultural water management; seasonal variation in water availability; water-related emergencies; flooding; watershed management; water-related ecology; wetlands; coastal zone management; climate change and variability; wastewater; water for national security; pricing and cost recovery; public participation and access to information; water infrastructure; water supply reliability criteria; gender; and poverty alleviation.
- Outlines instruments for policy implementation
- Outlines the process for review and revision of the policy, and provides direction for the assignment of responsibilities for implementation of the policy

The objectives of the Policy will be implemented through new legislative and institutional frameworks, existing plans such as the National Physical Development Plan and the Tobago Regional Physical Development Plan, as well as the newly proposed National Integrated Water Resources Plan, Coastal Zone.

The Pacific SIDS

The Pacific Island Countries (PICs) vary considerably in size, geomorphology, hydrology, economics, and politics. The Pacific region has a wide variety of island types, ranging from the large, high volcanic islands like Papua New Guinea, to the tiny, low coral atolls of Kiribati and the Marshall Islands in Micronesia. Some of the PICs consist of a few relatively sparsely inhabited islands, while others have much more densely populated island groups. With a population of less than 2,000, Niue, a single, 259 sq-km island (and one of the world's smallest self-governing states), has no natural surface-water features and is entirely dependent on rainfall harvesting and groundwater. In contrast, Papua New Guinea, with a population of over 5.5 million and a land mass of nearly half a million sq km, has more than 11,000 km of waterways, including several large river systems. There is clearly a need for a variety of water governance and resource-management strategies and approaches relevant to the different scales and levels of capacity and need.

Implementation of IWRM in the Pacific SIDS

While IWRM as an overarching national concept has not been widely applied, most PICs have made some advances in the water sector generally. These include institutional arrangements for water resource management and supply, and the application of IWRM and catchment principles at the local and regional levels (including the development of partnerships).

The importance of IWRM to SIDS, captured in the Pacific Regional Action Plan on Sustainable Water Management (Pacific RAP), was formally endorsed by the Pacific Heads of State in 2003. The RAP identifies IWRM as a solution for managing and protecting water resources and improving governance arrangements, and therefore improving water supply and sanitation provision. It aims to improve the assessment and monitoring of water resources, reduce water pollution, improve access to technologies, strengthen institutional arrangements, and leverage additional financial resources in support of IWRM.

Challenges to IWRM in PICs

The common challenges to water resources management and water-use efficiency throughout the PICs can be summarised as follows:

- An increasing demand for potable, irrigation and industrial water, brought on by a rise in population, increased tourism and/or expanding development
- Inadequate and inefficient capture, storage and distribution of water resources, which is related to small catchments, inadequate rainfall forecasting, poor watershed management, and poor infrastructure
- Pollution and the associated reduction in water quality as a result of:
 - Poorly controlled urban and industrial expansion and development
 - Inappropriate domestic waste disposal
 - Inadequate sanitation and drainage infrastructure
 - Inappropriate agricultural practices such as erosion of soils, excessive use of agro-chemicals, and deforestation
- Climatic threats to water supplies, e.g. droughts, flooding, storm surges, and sea-level rise.

These problems can be linked back to the following root causes:

- Insufficient knowledge of water-resource distribution, flow and management (hydrology, hydrogeology and recharge)
- Insufficient education, training and capacity in IWRM and water use efficiency at various levels, including government, private sector and community

- Lack of access to, and awareness of, appropriate technologies and methodologies for IWRM and water-use efficiency (WUE), including wastewater management and sanitation
- Lack of access to models and demonstrations of IWRM and WUE at national and catchment level that are appropriate to PICs and SIDS
- Inappropriate policy, legislation, planning and administration.

IWRM projects in the Pacific SIDS

The Pacific SIDS have implemented the EU-financed “Pacific IWRM National Planning Programme.” This project focused on strengthening governance structures (coordinating national water committees) and frameworks (policy, legislation, action plans) to mainstream IWRM and WUE into national planning processes.

The PICs are currently implementing the GEF-financed “Sustainable Integrated Water Resources and Wastewater Management Project in Pacific Island Countries.” This project focuses on practically demonstrating and developing IWRM best practices to address national priority water issues. Through this project 13 PICs have established National Inter-Ministerial Water Committees. IWRM principles have been incorporated into national strategic frameworks and three PICs, through the national committees, have held national water summits to launch water policy and legal reform processes directed by presidential decrees.

Both projects support the implementation of the Pacific Regional Action Plan on Sustainable Water Management that aims to improve the assessment and monitoring of water resources, reduce water pollution, improve access to technologies, strengthen institutional agreements, and leverage additional financial resources to support IWRM.

During the design of the projects, countries undertook situational or needs analyses (National Diagnostic Analyses), to provide the basis for policy development, strategy choice, the development of National IWRM Plans.

Three of these national diagnostic analyses undertaken in 2007 are summarised in Boxes 14 to 16, from information contained in the national IWRM Diagnostic Reports, which were commissioned the same year. By 2008, the Pacific Island Countries had progressed to varying extents in establishing some form of the key governance structures and frameworks that support integrated and strategic planning and management, such as establishing a water body, or revising policy, legislation and action plans (Table 1.1). All countries had formulated WUE Plans while six countries had IWRM plans and/or strategies.

Table 1.1 Water Governance in Pacific island Countries (2008)

IWRM Keystone	Pacific Island Countries													
	CI	FSM	FJ	KI	RMI	NR	NI	PA	PNG	SA	SI	TO	TV	VA
National Water Apex Body	■	■	□	□	■	■	□	□	□	□	□	■	□	□
Water Policy	□	■	□	□	□	■	□	□	□	■	□	□	□	□
Water Legislation	■	■	□	□	■	■	□	□	□	□	□	□	□	■
IWRM Plan/ Strategy	□	■	□	□	□	■	■	■	■	□	■	■	□	□
Water Use Efficiency Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■

CI, Cook Islands; FSM, Federated States of Micronesia; FJ, Fiji; KI, Kiribati; RMI, Marshall Islands; NR, Nauru; NI, Niue; PA, Palau; PNG, Papua New Guinea; SA, Samoa; SI, Solomon Islands; TO, Tonga; TV, Tuvalu; VA, Vanuatu.

■ Non-existent; □ Draft/interim; ■ Fully functional and effective.

Box 14. Cook Islands: National Integrated Water Resources Management Diagnostic Study



Coastal lagoon on Rarotonga – Cook Islands

Source: SOPAC

Current IWRM approaches in the Cook Islands are well developed in some areas but very weak in others. Hydrometric monitoring (a relatively recent initiative), Geographical Information Systems (GIS) and digital imagery for information storage and display; and planning for disasters and climate change, are some of the Cook Islands' strengths in IWRM approaches. The Islands have also implemented initiatives around community awareness of land use, freshwater and marine interactions; improving water-supply infrastructure; water demand management and water quality monitoring. In these cases there have been initiatives to develop these areas of IWRM, but there is still a considerable amount of work to be done to make them mainstream water-resource management concerns.

Some of the barriers to IWRM observed are:

- The lack of a national legislative and policy framework
- Inadequate understanding of how wastewater impacts on near-shore marine environments
- Inadequate human capacity
- Water leakage and wastage
- Water supply security.

Although there are many areas that need addressing for IWRM to be achieved in the Cook Islands, there is considerable potential.

Box 15. Fiji: National Integrated Water Resources Management Diagnostic Study

The government administration of Fiji does not explicitly identify water resources management. No minister is responsible for water resources, although ministers have responsibility for water supply, irrigation, power generation, agriculture and environment. Coordination is provided by the National Water Committee, an *ad hoc* committee established by Cabinet in 2001 made up of the heads of the key water resources agencies of the government.

The legislation in Fiji covers various water services, but does not deal explicitly with IWRM. There is legislation covering urban water supply (Water Supply Act); irrigation (Irrigation Act); use of water by mining enterprises (Minerals Act); and the taking of water from rivers and streams (Rivers and Streams Act). The Rivers and Streams Act, originally a colonial ordinance, provides for the Lands administration to approve water abstraction from rivers, and also allows traditional activities to be conducted by native Fijians in small streams. Importantly, the Act contains provisions that imply the right to water resources to be in the power of the government. The Environment Management Act (2000) further introduced protection powers relating to water quality (both freshwater and marine).

The Government has adopted a national water policy, which includes a commitment to introduce water legislation, to consider a stronger form of national coordination for water resources, and to review water resources information.



Nadi River estuary, GEF Pacific IWRM Project

http://www.pacific-iwrm.org/google/GEF_PACIFIC_IWRM_PROJECT

Box 16. Tonga: National Integrated Water Resources Management Diagnostic Study

Freshwater in Tonga comes from rainwater harvesting or extraction from a thin freshwater lens within the Island's highly porous limestone substrate. Groundwater is used domestically and is piped to homes, government buildings, shops, industries and tourist accommodations by the Tonga Water Board (TWB) in the urban centres. Many villages outside these centres have their own reticulated water system administered by water committees. The Tonga Water Board supply is metered at each property. Some villages are now introducing individual meters.

There is no centralised reticulated sewerage system in Tonga. All wastewater is managed by on-site systems, with supervision by the Ministry of Health. There is currently no overarching national water resources and water services policy. Various organisations have specific responsibilities and are individually mandated.



Borehole overhead mechanical pump in Tonga.

Source: Davendra Nath-SOPAC

Examples of IWRM project in the Pacific SIDS

Although some countries have formulated the necessary modalities for water governance with donor funding, there is the risk of these modalities not being sustained. The examples discussed below demonstrate some of the threats to IWRM faced by Pacific SIDS.

Fiji

Fiji has developed a draft water policy and a draft Water Resources Act. Fiji has also formed a National Water Committee and formulated a draft strategy to support the IWRM process. The Cabinet has since adopted the draft Policy for the Interim, subject to an ongoing consultation process. The IWRM process in Fiji will need to raise awareness and understanding of IWRM to ensure political commitment to dealing with complex issues such as water ownership. There is a risk that urgent issues such as flooding and limited water supply will overshadow overarching policy processes, resulting in a disjointed and fragmented approach to the resource and its management, and a lack of attention to the interconnected nature of land and water.

Solomon Islands

The Solomon Islands have drafted a National Water Resources Policy and a National Water Resources Legislation, formed a Water Group and drafted terms of reference for a National Steering Committee to support the IWRM process. The government has allocated a budget for the IWRM process and has focused on consultations and review of the National Water Resources Act. Yet, the Solomon Islands are faced with challenges such as resolving water ownership issues (especially in view of increased mining activities). Another challenge is raising awareness on water resources management (specifically as it relates to land-use practices), taking into account low literacy rates in communities.

Kiribati

The main challenges to IWRM in Kiribati include politicised resource-management approaches; low government awareness and political will; and the dispersed nature of the land and population. These challenges lead to delays in the adoption of draft national water plans, policies and legislation. However, the reformation of the Kiribati Water Supply and Sanitation Coordinating Committee under the Office of the President partly addresses the problem of intersectoral competition. It is, however, recognised that the progress toward IWRM will be influenced by the means and success in coordinating the various ministries, agencies, and departments involved. The IWRM process also needs to take into account, and be adapted to, the cultural circumstance of Kiribati.

The three examples above point to two main issues:

- Pressing national issues, such as mitigating flooding and overhauling of the water infrastructure systems can take precedence over IWRM; and
- IWRM has to be contextualized within local political, social, and cultural systems, including traditional governance systems, taking into account cultural values and social hierarchies.

As mentioned previously, in addition to the interventions in water governance, the PICs are also involved in a suite of demonstration projects financed by the GEF. The GEF initiative is using country-driven and -designed demonstration activities focusing on sustainable water management; it is also applying “Ridge to Reef” IWRM approaches to bring significant environmental-stress-reduction benefits.

Some of the demonstration projects described here will act as catalysts for replication and scaling-up approaches to improve national water resources management. Regionally, they will support the PICs in reducing land-based pollutants from entering the ocean. Some of these demonstration projects are summarised in Boxes 17 to 19, from information obtained from The GEF IWRM Project on Google Earth (<http://www.pacific-iwrn.org/pacific-iwrn-on-google-earth.html>)



Providing sustainable water systems to the Outer Islands in Kiribati.

Source: SOPAC

The demonstration projects are still under implementation. The following observations were made in 2010:

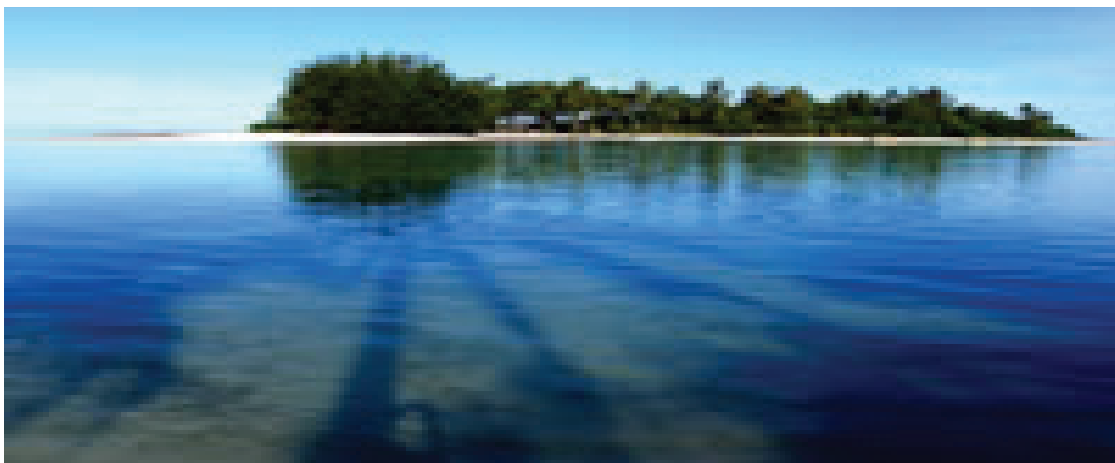
1. IWRM as an overarching national governance approach to water has not been widely applied in the Pacific region, although most PICs have made some advances in the water sector generally.
2. It is important to take note of cultural differences between PICs and the nature of different water management issues that they face. This also includes the differences that exist between main and outer islands in the same country.
3. IWRM in PICs needs to work at the community, national and regional levels in order to address the fragmented sectoral and organisational approaches.
4. While many of the PICs have already initiated water policy reform, fragmented institutions, low technical capacities, and lack of awareness and political support limit their ability to move the policy reform process forward.
5. Natural resources management in PICs had traditionally been the domain of traditional leaders. This system allowed for diverging community interests to be taken into account during the decision-making process. Modern political structures, in contrast, rarely provide for extensive consultation and participation in the decision-making processes.

Box 17. Cook Islands: Integrated freshwater and coastal management on Rarotonga

Aims: To improve the quality of groundwater, freshwater and lagoon water using an IWRM framework, and to gain information on the availability of groundwater for drought relief.

Activities:

- Technical assessment of water quality and quantity information measures;
- Knowledge dissemination to promote community knowledge and understanding;
- Institutional strengthening and human resource capability development measures.



Coastal Lagoon on Rarotonga, GEF Pacific IWRM Project
http://www.pacific-iwrn.org/google/GEF_PACIFIC_IWRM_PROJECT

Box 18. Federated States of Micronesia: Ridge to reef, Protecting Water Quality from Source to Sea

Aims: To improve drinking water quality and significantly reduce pollutants entering fresh and marine waters around Pohnpei Island and in Chuuk State.

Activities:

- Improvement of forest management and strengthening a Watershed Forest Reserve Area; Linking communities to create awareness on upstream to downstream impacts;
- Water quality monitoring;
- Assessment and mitigation of wastewater and pollution sources;
- Development of a Water Safety Plan and a Harbour Water Quality and Management Plan.



Ancient city of Nan Madol on Pohnpei, GEF Pacific IWRM Project

http://www.pacific-iwrn.org/google/GEF_PACIFIC_IWRM_PROJECT

Box 19. Niue: Using Integrated Land Use, Water Supply and Wastewater Management as a Protection Model for the Alofi Town Groundwater Supply and Nearshore Reef Fishery

Aims: To protect the Alofi groundwater, well-field and nearshore area from over-abstraction and land-based pollution through an IWRM framework.

Activities:

- Improve management of hazardous waste, solid waste, and wastewater;
- Reduce run-off from industries, fisheries processing, agriculture and roads;
- Raise awareness and planning for water conservation and demand management;
- Establish groundwater protection zones;
- Carry out hydro-geological and water quality surveys for maintenance of well-field;
- Water policy and planning.



Rocky shore of Niue, GEF Pacific IWRM Project

http://www.pacific-iwrn.org/google/GEF_PACIFIC_IWRM_PROJECT

The Indian and Atlantic Oceans SIDS

Cape Verde, Comoros, Maldives, Mauritius, Sao Tomé et Príncipe, and Seychelles make up the Indian and Atlantic Ocean SIDS. These SIDS differ in size and economic development, but have many common environmental features. They also share problems related to high levels of pollution, which results in the contamination of already-scarce water resources, and overexploitation and poor management of water supplies and recharge sources.

Cape Verde, Mauritius, Maldives and Seychelles have developed high-end tourism products that demand high quality and volume of water and a near-pristine coastal marine environment. The sector also generates high per capita volumes of wastewater.

In contrast, Comoros and Sao Tomé et Príncipe, while without the challenges and demands associated with tourism success, do have problems related to their more subsistence economies. Agriculture, even at subsistence levels, is putting increasing pressure on watersheds; Comoros, in particular, is concerned about high population densities whereas Sao Tomé relies upon cocoa production, which is associated with increased watershed degradation.

Fishing is important for all countries, whether commercially as in Cape Verde, Seychelles and Mauritius, or on a smaller scale aimed for the domestic market, as in Maldives, Comoros and Sao Tomé et Príncipe.

Cape Verde and Mauritius have recently invested significantly in water supply and wastewater infrastructure. However, without integrated management, infrastructure development can increase water demand, wastewater generation (and therefore pollution), and does not guarantee improved sustainable livelihoods, economies, public health or environmental protection.

Implementation of IWRM in the Indian and Atlantic Oceans SIDS

Most of the SIDS in the Indian and Atlantic Oceans have some cross-sectoral water governance arrangements in place, and the more developed ones have local water resources monitoring and management capacity (Cape Verde and Mauritius). However, coordination remains weak, largely ineffective and mostly limited to government stakeholders. Comprehensive integrated approaches are either entirely absent or (as in Cape Verde) under-resourced. Boxes 20–22 summarise the IWRM situation in three of these SIDS.

Challenges to IWRM in Indian and Atlantic Oceans SIDS

All six countries have completed diagnostic studies that reveal the following barriers to IWRM:

1. Limited and fragile water resources susceptible to over-exploitation and pollution, with often-limited technical management capacity to sustainably exploit and protect them
2. Vulnerability to climate variability resulting in rapid onset of flooding and droughts, as well as follow-on effects, such as threats to public health, damage to infrastructure, and degradation of quality of existing fragile water resources
3. Insufficient political and public awareness of the critical role of water in supporting economic development, public health and environmental protection
4. Excessive urban water demand due to high water losses and poor water conservation;
5. Inadequate drinking water treatment due to limited technical resources

6. Inadequate wastewater management resulting in freshwater and coastal water pollution due to an over-reliance on on-site septic tanks, and poorly maintained sewerage systems
7. Fragmented national water governance due to restricted formal communication and coordination among government departments, and limited active involvement of the civil society
8. Conflicts between national versus island, local and traditional rights, especially in balancing the needs of land and water resources planning with customary land ownership
9. Inadequate financing of water and sanitation provision due to poor cost-recovery systems, but also a lack of “economies of scale” for funding resources, health and environmental protection
10. Weak linkages both to other stakeholders within the water sector, and particularly to other economic sectors, such as those dealing with public health and the environment.

IWRM projects in Indian and Atlantic Oceans SIDS

All six countries are participating in a GEF-financed project titled “Implementing Integrated Water Resource and Wastewater Management in Atlantic and Indian Ocean SIDS”. The project focuses on freshwater (surface and ground) and coastal receiving waters, with the overall project objective *“To accelerate progress on WSSD targets, IWRM and WUE plans, and water-supply and sanitation-related Millennium Development Goals for the protection and utilization of groundwater and surface water in the participating countries.”*

One of the four components of the GEF-financed project is local demonstration projects. The objective of the demonstration approach is to provide tangible local benefits attributed to the introduction or strengthening of IWRM approaches. It is envisaged that the demonstration projects will provide credibility to IWRM and support longer-term IWRM governance changes. Demonstration interventions aim to reduce environmental stress, improve community access to clean water, support innovative approaches to determine the best use of water resources (both technical and allocative efficiency), reduce water-related health risks through protection of water supplies, and/or reduce sewerage releases into the freshwater and marine water environments. Some of the demonstration projects will also show how water is used and managed as a tool for adaptation to climate variability. Three of these demonstration projects are described below.

Maldives

The demonstration project in the Maldives is entitled “Groundwater protection through sustainable extraction of freshwater from shallow aquifer”. Located on the largely agricultural island of Thoddoo, the project focuses on protecting the island’s groundwater resources from salinisation and reducing agro-chemical pollution, whilst piloting a more effective groundwater abstraction technique that is more resilient to drought periods and hence climate change, and with increases abstraction yields. The project has strong awareness-raising and replication components, with the technology being seen as applicable to outer-island water supply.

Sao Tomé et Príncipe

The demonstration project in Sao Tomé et Príncipe is entitled “Integrated Management of the River Provaz Basin”. The Provaz Basin is facing increasing water demand, is prone to flooding, and is becoming increasingly polluted. The project takes a basin-management governance approach, with activities focusing on surface water flow and quality assessment, basin stakeholder partnership development, and stakeholder IWRM capacity building.

Seychelles

The demonstration project in the Seychelles is entitled “Towards Sustainable Use of Freshwater Resources on La Digue Island.” The project focuses on the small island of La Digue, which suffers from high water demand and high land-use pressures. The project takes an integrated approach to protecting the groundwater resources through a wide range of small-scale water-demand-reduction approaches, including awareness-raising on water conservation, tariff incentive schemes, supply system loss reduction, rainwater harvesting and wastewater re-use. At the same time, it aims at improving groundwater quality through improved septic tank and wastewater sewerage system management, reducing seawater inundation, promoting flashy surface water flow capture and recharge, improving hydrocarbon waste collection and disposal, and linking the outcomes with a national water-sector review.

Box 20. Cape Verde: Water Resources Management

Cape Verde has a complex and partially integrated policy framework, including a National Development Plan, National Policy on Water Resources, a National Sanitation Policy and various water-related legislation. It has specific IWRM-related plans, including the Inter-Sectoral Plan for Water Resources and the Environment, Master Plan for Water Resources Management, and Action Plan for Integrated Water Resources.

Institutionally it has functioning IWRM structures, including a National Water Council (policy level body) and a nascent National Water Partnership (which includes public and private water stakeholders). The National Water Resources Management Authority (INGRH) is the lead agency for water resources, but institutional responsibility for sanitation remains unclear. Water councils and watershed committees function at the island- and basin-scale, respectively. Cape Verde thus has considerable IWRM governance arrangements in place. The main challenges appear to be related to wastewater management responsibilities, coordinated implementation at the island and municipal level, and sustaining the infrastructure and governance support provided to date, through capacity building.



Water storage in Cape Verde.

©Masakazu, Shibata

Box 21. Comoros. Status of Water Resources Management

Comoros is a union of four federal states, with national ministries and committees overseeing regional and island-specific management structures. There are integrated decision-making bodies at the national level, such as the National Committee for Sustainable Development (CNDD), a multi-ministerial committee that operates on each island as Insular Committees for Sustainable Development (CIDD). Both CNDD and CIDD consider water-related issues to be the ministry's responsibilities. There are, however, no formal coordination mechanisms for IWRM within the country; there is also a substantial lack of institutional capacity across all sectors and agencies. There are no formal water management policies or plans, and adequate water supply and sanitation, as well as drought and land degradation, remain problematic.



Southern N'gazidja Island, Comoros.

© M. Trautner

Box 22. Mauritius: Status of Water Resources Management

Mauritius has a well-defined governmental water management structure, including a Water Resources Unit (WRU) which coordinates the planning, infrastructure and water allocation requirements of potable water supply, wastewater disposal, hydropower, irrigation and tourism demands. Despite being located in the Ministry of Renewable Energy and Public Utilities (MREPU), the WRU is also responsible for water resources assessment and protection. This integrated management approach is further strengthened through the Water Resources Monitoring Committee (WRMC), whose members include all major water using agencies and sectors. The WRMC makes decisions on water allocation, between the sectors, both at a planning and operational level. Each agency has representatives of other agencies on its Board of Directors, a mechanism which improves policy and planning coordination between the agencies. The MREPU has overall responsibility for water-sector policy formulation.

A national water policy (inclusive of IWRM) for Mauritius is presently in development, as is a national water resources master plan. Most existing plans and policies are sector-specific, and most existing legislation is either sector-, agency-, or issue-specific (e.g. the Wastewater Management Authority Act). Wastewater disposal, whilst lagging behind, is also showing evidence of becoming more integrated, with respect to reduction, reuse and recharge. Mauritius has therefore strong IWRM governance and infrastructures in place, although as yet civil society is not well represented.



The Chamarel Waterfall.

©St. Denis and Viande Salee

The parent GEF-funded project will support the participating SIDS in developing Integrated Water Resource Management Plans.

The countries are also implementing or are scheduled to implement other projects involving the management of their water resources. Maldives, for instance, will be implementing a project on IWRM and climate change, funded by the Climate Adaptation Fund. Maldives is also receiving assistance from the US in implementing IWRM interventions.

In 2008, Seychelles formulated a Water Supply Development Plan for its three main islands in order to firstly, attract the necessary water project investments to meet demand up to the year 2030, and secondly, to mobilize the resources for the Plan's immediate implementation until 2015 as an intermediary step. One of the aims of the project is to identify and implement measures to reduce overall water demand and improve the performance and service delivery of the Water & Sewerage Division (WSD) of the Public Utility Corporation (PUC).

In conclusion, Indian and Atlantic Ocean SIDS have to deal with natural water scarcity, rapid onset of drought and flood hazards, and increasing water quality deterioration associated with inadequate wastewater discharge and high land pressures. At the same time, they must address high leakage rates and rising water demands. The national management arrangements in these SIDS are typically fragmented and sectoral, with the civil society poorly informed and sometimes beyond the influence of government.

Summarising the SIDS Experiences in IWRM

The SIDS in the Caribbean, the Pacific, Indian and Atlantic Oceans have undertaken a number of IWRM initiatives without first preparing an IWRM plan or undertaking major reforms to their water sectors. The general principles of IWRM are present and applied, but without IWRM planning in its proper sense as a concept and approach.

These SIDS have progressed in different ways in establishing some of the key governance structures and frameworks that support integrated planning and management of water resources, be it in forming a water apex body, revising policy, legislation and action plans, or even designing demonstration projects. This is evidence that reform in water governance is not a necessary prerequisite for IWRM in SIDS. Different types of interventions in the water sector, if carefully planned and executed, can ultimately lead to sound IWRM.

The main management challenge for SIDS is not the lack of a vision of integrated water resources management, but a "pragmatic but principled approach that respects principles of efficiency, equity and sustainability while recognizing that water resources management is intensely political, and reform requires the articulation of prioritized, sequenced, practical and patient interventions"¹.

The IWRM Approach for SIDS² should consider all the interactions of water with nature and humans, along its route from ridge to reef³, and implementing IWRM must be seen as a course of continual adjustment and adaptation within this space. Additionally, much like the concept of sustainability, IWRM is not an end-state to be achieved, but rather a continuous process of balancing, and making trade-offs between different goals and views in an informed way.

1 World Bank, 2003. Water Resources Strategy Paper.

2 The Pacific Island Countries (PICS) who have progressed the most towards IWRM, amongst all SIDS, also define their planning for IWRM as an approach: Refer to SOPAC (n.d.) *Planning for Integrated Management of Water Resources in the Pacific: Why do we need it and How Does it Work*.

3 This extends from the catchment to the coastal receiving waters.

One of the central aims of IWRM is to promote coordination and integration as a means of achieving more holistic water management and improving water resource sustainability^{4,5}. Integration means not only the coordination between different economic sectors, institutions, agencies, policies and legislation, but also between different elements of the community. It is this balancing of goals and views of interdependent players that separates “integrated management” from other forms of management practice⁶, and that is a vital element of IWRM⁷.

Involving the civil society from the outset of the IWRM process is important for clarifying issues, reaching agreement on goals and objectives, prioritizing investment, and mobilizing support for innovative policies and activities related to water supply and sanitation. The key challenge of the SIDS IWRM approach then is to make sure that the focus is not so much on the desired outcome—a reformed water sector that allows for optimum allocation of water among all sectors—but on the practical activities involved in achieving the outcome.

An IWRM Planning Approach Suitable for SIDS

Reference is made to Figure 1.1.

The **definition** of IWRM stands as articulated by the Global Water Programme (GWP), i.e. “IWRM is a process that promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.” Similarly, the overriding criteria for pursuing IWRM in SIDS are consistent with the GWP, i.e. “economic efficiency in water use; equity; and environmental and ecological sustainability.”

In practice, many SIDS lack the broad political support needed to get the process of creating an national IWRM plan and strategy off the ground. Hence, IWRM Plans developed at the national scale and for the entire water sector are in most instances not practical for SIDS. The following conclusions are pertinent to IWRM for SIDS:

1. It is effective to define a geographic **entry point** (e.g. a specific watershed or a community)—focusing on one or two areas where water problems are particularly acute—and to use these as pilot cases to demonstrate the effectiveness of IWRM.
2. The application of an **“issues-based approach”** will more readily lead to an action strategy based on tangible and immediate issues. It has also been shown that such an approach can help win broad public support. The main management challenge for SIDS is not the lack of a vision of integrated water resources management but rather the lack of a pragmatic plan of action.
3. IWRM planning and implementation for SIDS **should not be seen as an end-state to be achieved**; it is a continuous process of balancing and making trade-offs between different goals and views in an informed way.

4 Jørch-Clausen, T, and J. Fugl. 2001. Firming up the conceptual basis of integrated water resources management. *International Journal of Water Resources Development* 17(4):501–511

5 Braga, B. P. F. 2001. Integrated urban water resources management: a challenge into the 21st century. *International Journal of Water Resources Development* 17(4):581–599.

6 Grigg, N. S. 1999. Integrated water resources management: who should lead, who should pay? *Journal of American Water Resources Association* 35(3):527–534.

7 Radif, A. A. 1999. Integrated water resources management (IWRM): an approach to face the challenges of the next century and to avert future crises. *Desalination* 124:145–153.

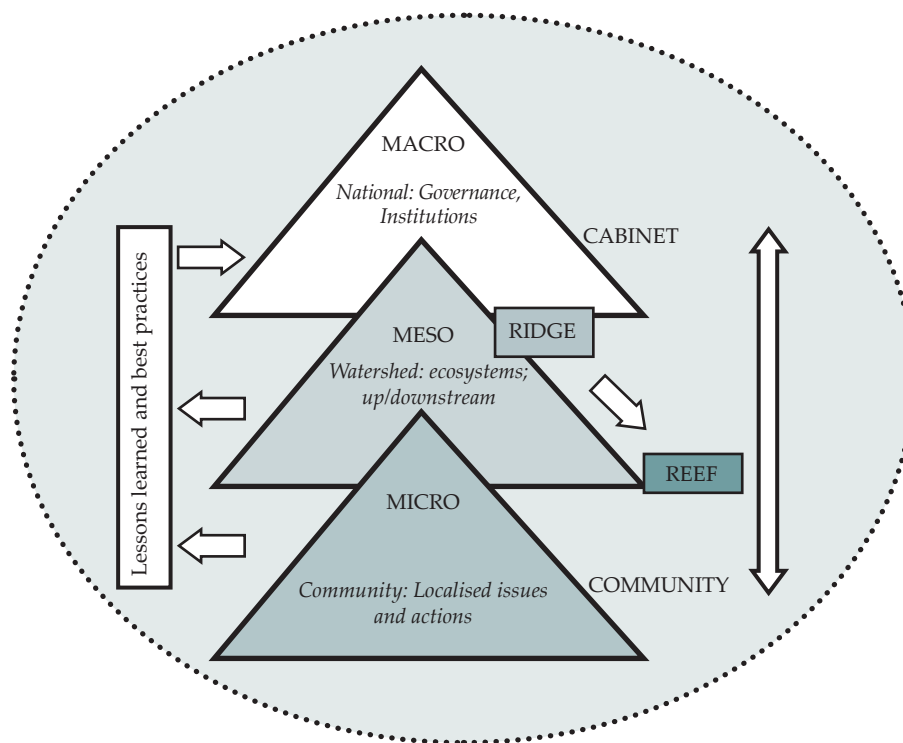


Figure 1.2 IWRM for SIDS

4. The **scale of IWRM for SIDS is the entire watershed and its receiving waters**. In some instances it will be appropriate to adopt a watershed/catchment approach while in others, as in the case of islands with a single watershed, the entire island may have to be considered. The issues-based-approach allows for a defined geographic entry point at any level—macro (national), meso (watershed), or micro (community) level. Thus, the extent of the issues, the stakeholders and their roles and responsibilities, as well as the response mechanisms will depend on the scale of the entry-point. Committed partners will adopt the IWRM principles at their own level of operation.
5. National-level IWRM with full stakeholder participation remains a target, but is not a prerequisite for action.
6. Initial **major reforms in water governance are not a requisite for IWRM implementation** or for catalyzing change in the water sector. First steps that can easily be implemented are often enough to begin the process of moving towards more sustainable water development and management.
7. It is important to **understand water-sector priorities** in the country's national development, and then to address the most obvious and pressing key priority issues identified.
8. Each country will have different priorities and planning systems, and therefore different entry-points. From these, better water management can and should be promoted. This approach is most likely to achieve political, institutional and general public support in the short-term.
9. Islands have started to look at managing water resources not only within the watershed, but also based on the receiving coastal waters. In the Pacific this management concept has been referred to as “Ridge to Reef” or “Hilltops 2 Oceans (H2O)”. In the Caribbean it is also known as “White Water to Blue Water” (Fig. 1.2). The Ridge-to-Reef concept is not just about sustainable yields of the water resources, but also primarily about the linkages between the terrestrial and the coastal environs, and more specifically vectors for pollution migration⁸. Poor sanitation practices and infrastructure can impact on ground water resources, and the discharge

⁸ Whilst groundwater flows at many orders of magnitude less quickly than surface water it i) provides baseflow to streams, and ii) if not used, has to discharge as submarine springs into the near shore environment. As such any land use activity which has the potential to contaminate a stream can equally contaminate the groundwater.

of untreated industrial and domestic water into the coastal environment impacts on important coastal ecological systems and nearshore marine resources. Hence sanitation and wastewater management are important elements in IWRM for SIDS.

Boxes 23 and 24 summarize the SIDS IWRM approach.



Figure 1.2 Schematic representation of Ridge to Reef

Source: National Water Apex Bodies: A Guide for Pacific Island Countries (SOPAC/2008)

Box 23. Integrated Water Resources Management (IWRM) for Small Island Developing States (SIDS)

IWRM for SIDS typically has the following features:

- It is spatially conceptualised within a watershed and its receiving waters, i.e. from ridge to reef
- It entails understanding of the relationship between activities on land and coastal waters
- It has the Ecosystems Approach as the overarching strategy
- Its approach is a continuous process of balancing and making trade-offs between different goals and views at the national, watershed and community levels
- It is adaptive and interactive
- It is issue-based, with defined “entry-points”, and is integrated into national development. Entry-points can be at the national (macro); watershed (meso) or community (micro) levels
- It focuses on incremental steps, and tangible issues and deliverables
- Steps can be undertaken in any order and/or simultaneously
- Its focus is not on outcomes, but on the practical activities involved in achieving the outcomes
- It acknowledges the significance of associated regional approaches and regional technical assistance.

Box 24. The SIDS IWRM Paradigm

The paradigm for IWRM for SIDS:

- Is a pragmatic approach towards better and more sustainable water management;
- Is a process which promotes the co-ordinated development and management of water, land and related resources, without compromising the sustainability of vital eco-systems;
- Is not a time-bound plan to guide a country in using and managing its water resources with clearly identified goalposts and milestones.
- Does not require all actions to be fully integrated and handled by a super-agency that replaces the many actors in water.
- Is about stakeholders finding ways to coordinate and address coordination problems in the management of water resources.

SECTION 2

Conceptual Framework and Methodology

Existing guidelines for integrated water resources management (IWRM) have used planning cycle frameworks. In general this cycle starts with identifying water-related problems and developing area-specific long-term visions for water resource development. These visions then determine the strategies and plans to put in place to address the problems. The strategizing process is supported by the collection and analysis of relevant information on water resources, e.g. infrastructure; actors; demand and access; etc.

The planning cycles recommended in existing guidelines also have a similar approach: A logical sequence, continuity, and a strategic approach; they also call for participatory decision-making and stakeholder involvement.

The IWRM Planning Cycle for SIDS

An IWRM planning cycle that is suitable for SIDS has similarities to that for traditional IWRM, but has several important differences. Among the salient characteristics of IWRM planning cycle for SIDS are as follows:

- i. It is a **practical and logical framework** of activities for the development and implementation of IWRM development plans at the national level; at the level of watersheds or catchments; and at the level of villages and communities.
- ii. It advocates **collaboration and dialogue** between all stakeholders involved in solving a problem, whose solution will contribute to improving the management of the water sector at the macro, meso, or micro level. The stakeholder dialogue and consultation involves creating time, space, and institutional platforms for interaction between those who have a stake in the water resources and those who provide the services, within a specific geographical area. The approach brings together relevant stakeholders at different levels—national (macro), watershed/catchment (meso), and community (micro)—on water issues, using various interventions.
 - At the **national level**, an IWRM programme brings together the various public and private sectors involved in water resource management. It also involves agencies that are not directly engaged in water resource management, but which are responsible for financing national initiatives on water resources management; various water resource users and providers; academic institutions; and representatives from community groups.
 - At the **watershed/catchment** level, the number of stakeholders is much reduced. Stakeholders at this level likely include agencies within the sectors that are most affected by the issues under consideration; water service providers for the area; representatives from community group that live within the watershed/catchment; and other agencies that are involved in the social and economic development of the watershed/catchment.

- **At the community level**, there is greater representation from members of the community, including the various groups involved in conflicts/disputes in water use and management; representatives of national agencies involved in the management of water and in the provision of water services; and representatives of NGOs that work in the community.
- iii. The concept of physical scale and the issues related to it are critical to IWRM in SIDS. Scale is particularly important because of the limited hydrological cycle on an island. The most important aspect of scale in SIDS is that all users of water from a common watershed/catchment or aquifer are linked by the hydrological cycle which stretches from the ridge to the coast and its receiving waters. This is rarely evident to individual users. For example, people do not always experience directly the impact of their behaviour on downstream users. But the aggregation of actions of hundreds of individual users, each action in itself possibly insignificant, leads to impacts that are significant to other users. Thus, while some problems can be mitigated at the community level, others have to be addressed at the watershed or national level. At the same time, irrespective of the level (macro, meso or micro) at which an intervention in water resources management takes place, every level has an impact on the other.

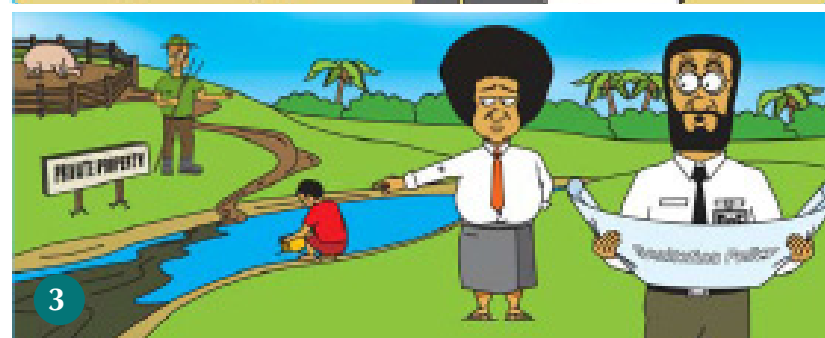
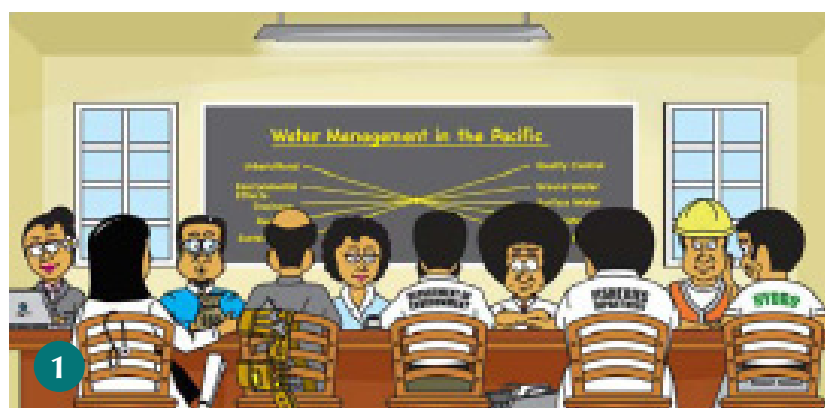
Therefore, interventions at the community level must be cognizant of and reflect the legal, institutional and policy framework at the national level. Similarly the lessons learned at water resources management at the community level should be able to feed into other experiences in the watershed. Together, these experiences should provide best practices for further improving the national legal, policy and institutional frameworks.

- iv. Institutional or administrative levels are closely related to issues of scale. Each level has responsibility for different actions. Ideally, for IWRM in SIDS, these responsibilities should take account of scale-related issues. So, while a village could have the responsibility of managing individual water supply structures (tanks, wells, pipe networks, etc.) within its boundaries, authorities at the watershed and national levels must, for instance, take responsibility for ensuring that the aggregation of the actions of villages on downstream users are acceptable.

Pillars of IWRM Approach for SIDS

The **Planning Cycle** and **Stakeholder Participation and Dialogue** are two important pillars upon which the IWRM Approach for SIDS is constructed. The Planning Cycle is a six-step process. There are a number of sub-components and activities within each of these six components. The cycle will not be effective if key actors, or any of the components, are left out during the planning, negotiation and implementation of the Strategic Plan.

The Cycle for developing the SIDS IWRM Strategy and Action Plan starts by identifying an “**entry Point**” for mitigating an identified issue or cluster of related issues. The entry point is identified after a series of diagnostics and a Problem Tree Analysis. Frequently, the entry point will revolve around water quality and/or water quantity issues. Once the root problem has been clearly articulated and the entry point identified, then the process follows a strategic planning cycle.



Collaboration and Dialogue between stakeholders.

1. Creating room for planning and coordination
2. Agreeing on common goals and objectives
3. Working together and keeping track of how we are doing
4. Listening and sharing information

Source: SOPAC – Planning for Integrated Water Resources Management in the Pacific

Steps in the SIDS IWRM Planning Cycle

The six main steps in the SIDS IWRM Planning Cycle are: Diagnosing; Visioning; Strategising; Planning; Implementing; and Monitoring and Evaluating. These are described in detail below.

Step 1. Diagnosing

Information is collected and analysed on the current situation and the problems encountered. The information relates to different aspects of water resources – physical, supply, demands, types of water services; different users and uses of the water resources, policy, legal and institutional frameworks guiding water use and management, etc. Various tools are used to analyse the information, the most common being analyses of ‘hot-spots’ and ‘sensitive areas’.

Step 2. Visioning

In this step stakeholders identify the core problem, and its causes and effects. They then develop a future vision for water resources management to mitigate this problem.

Step 3. Strategising

Based on the visioning undertaken in Step 2 and with information generated in Step 1, stakeholders begin to develop different scenarios to achieve the vision. A frame strategy is developed for each of the scenarios. These strategies and scenarios are then reviewed and analysed to see which will best achieve the vision, given all the challenges, constraints and opportunities faced at that time. Sometimes the original vision may have to be altered in order to achieve a good fit with a strategy.

Step 4. Planning

Once the vision and the best strategy have been agreed upon, the planning process can begin. Typically, planning should take place for the entire strategy. There is, however, sufficient experience from SIDS to show that planning will normally take place for a sub-set of the entire strategy. The Plan will include a budget, schedule, roles and responsibilities, targets, and indicators to be used for monitoring and evaluation.

Step 5. Implementation

The Plan is implemented in a coordinated manner. There are often obstacles to implementation due to gaps in technical skills, inadequate funding, inadequate mechanisms for coordination and the roles and responsibilities of the various stakeholders, to mention but a few.

These issues should, however, have been thought through in Step 3 where different scenarios were created to achieve the vision within the scope of foreseen challenges, constraints and opportunities.

Step 6. Monitoring & Evaluation and Documentation

In this step stakeholders ensure that the actions identified in the Plan are carried out at the scheduled time, in accordance with the planned budget and responsibilities. It also provides stakeholders the opportunity to reflect on the progress achieved in order to determine if the original plan needs refinement, and to identify lessons learned in implementing the plan. These lessons will provide opportunities for further refinement of the strategy and/or for informing further refinement of existing policy, institutional and legal frameworks for water resources management.

Sub-steps in the Planning Cycle

Each of the six Steps is divided into sub-phases (Box 25). Activities in each of the sub-phases take place either before, during or at the end of each of the six steps. These sub-phases are described in detail below.

Step 1. Diagnosing

(i) Identifying an Entry Point

The Planning Cycle begins with the identification or conceptualization of an Entry point.

The Entry Point is a spatially or issue-oriented water resource problem for which a response has to be formulated. The response has to be sustainable; reflect national development priorities; be cognisant of the technical and financial resource challenges and constraints of the country; acknowledge the ridge-to-reef nature of an island's hydrological system; and acknowledge gender sensitivities in water use and management.

Once the Entry Point has been identified, a lead agency is identified to act as the “champion” and secretariat for the IWRM process.

(ii) Identifying a Lead Agency

Very often the agency that identifies the entry point becomes the Lead Agency. The lead agency will be responsible for the entire IWRM process relating to the issue identified in the entry point. It will also function as the Secretariat to the Coordinating and Facilitating Committee. It must, therefore, have the necessary resources to undertake its functions as secretariat. It must also have the resources to be able to include a number of the activities involved in the IWRM planning cycle into its own workplans. Refer to Box 26 for examples of Lead Agencies.

The agency that identified the entry point does not necessarily have to be the Lead Agency. The following example demonstrates this point: “A department within the ministry responsible for social affairs determines that the inadequate supply of water to a group of communities is part of the poverty and vulnerability profile of those communities. The Department identifies the need for water services to be extended to these communities. The Ministry of Social Affairs does not, however, have any mandate over water resources and will have to bring the matter to the attention of an agency with responsibility for water. The difficulty here, on the other hand, is that the water resource agency may not be willing to take on the role of Lead Agency because it does not have the resources to do so, or its own plan does not include extending services to those communities.”

These are some of the quandaries faced by SIDS, which are not only limited in terms of technical and financial resources, but also have room for a very small margin of error¹.

¹ Some SIDS have less than 100,000 residents; have a limited national budget and rely extensively on grants and foreign credit.

Box 25: Sub-steps in the IWRM Planning Cycle

Sensitisation

and

Awareness

Step in the Planning Cycle	Sub-steps
1. Diagnosing	<ul style="list-style-type: none"> i) Identifying Entry point ii) Identifying Lead Agency iii) Stakeholder Analysis iv) Establishing a Coordinating and Facilitation Committee v) Situation Analysis social [including gender, poverty] economic, environmental [including ecosystems approach]
2. Visioning	<ul style="list-style-type: none"> i) Problem Tree Analysis – cause and effects of root problem ii) Objective Tree Analysis – main cause is converted into objective of strategy
3. Strategising	<ul style="list-style-type: none"> i) Scenario Development— selection of possible development options <ul style="list-style-type: none"> • Framework Identification • Content Identification • Strategy Preparation
4. Planning	<ul style="list-style-type: none"> i) Plan Preparation <ul style="list-style-type: none"> • Action Plan and Budget • Responsibility Matrix • Scheduling • Monitoring targets and indicators
5. Implementing	<ul style="list-style-type: none"> i) Preparation of workplans and budgets and general administrative and financial management ii) Capacity Development iii) Institutional Strengthening iv) Strengthening the enabling environment – recalibrating policy and legal instruments for water resources management v) Data collection
6. Monitoring & Evaluation, and Documentation	<ul style="list-style-type: none"> i) M&E using indicators ii) Documentation of Lessons learned and Best Practices

It is imperative that whichever agency is finally selected to be the lead agency has the necessary financial and technical resources to champion the IWRM programme and provide the necessary secretarial and backstopping facilities to the FCC. This lead agency will also have to undertake a stakeholder analysis in order to identify the stakeholders who should form the Facilitating and Coordinating Committee, and to spearhead sustained sensitisation and public awareness campaign.

Examples of Lead Agencies

A lead agency for IWRM actions to be undertaken at the watershed/catchment area would necessarily be an agency with a mandate for water-resources management within that watershed or catchment area and one the communities in the watershed are familiar with. This agency should also be part of a Ministry or a national institution with the financial and technical resources to provide the necessary leadership throughout the Planning Cycle.

The lead agency will work closely with other government and civil society agencies that are already well established in the watershed/catchment area in order to win the support and goodwill of the communities.

At the community level, a successful lead agency will be one that is already operating in the community and that has proven capabilities in community mobilization. This agency does not have to have a mandate for water resources management, but must be able to win community support and respect. The agency could be the Village Council or a community-based organisation.

Experience has also shown that communities have to feel comfortable with working with the staff of an agency before they are willing to participate in any activities.

Once the Lead Agency has been established, it undertakes a preliminary Stakeholder Analysis in order to determine all the stakeholders in the IWRM process. In this way, the Lead Agency also determines the preliminary set of stakeholders who should be invited to be part of the Facilitating and Coordinating Committee (FCC).

(iii) Stakeholder Analysis

One of the first tasks of the Lead Agency will be to undertake a stakeholder analysis in order to identify agencies and institutions best suited to be part of the Facilitating and Coordinating Committee (FCC). Other stakeholders, as appropriate, can be brought in after the FCC has been established. Indeed, additional stakeholders will be brought in, as needed, throughout the Planning Cycle. But the FCC will be the core and remain so throughout the Planning Cycle.

A participatory approach to integrated watershed management is a critical aspect of IWRM demonstration projects. **The Fond D'or Watershed Management Committee (WMC)** is effectively the core of the participatory watershed management mechanism. It is made up of community members, government representatives, the water utility and other key stakeholders.

Box 26. Examples of Lead Agencies

- **Samoa:** Apia Catchment demonstration project to “rehabilitate and manage the Apia Catchment in order to improve the quality and quantity of the water resources for enhanced water supply, hydropower generation, socio-economic advancement and reduced environmental adverse impacts”.

Lead Agency: **Ministry of Natural Resources, Environment and Meteorology**

- **Republic of Kiribati:** Protection and management of groundwater resources for South Tarawa to “demonstrate the technical, social, economic, legal and environmental systems necessary to protect and properly manage groundwater sources and to demonstrate the health, environmental, social and economic benefits that flow from improved integrated management”.

Lead Agency: **Ministry of Public Works and Utilities**

- **Union Island, St. Vincent and the Grenadines:** Preparation of an IWRM Plan.

Lead “Drivers”: **The Environmental Services Unit in the Ministry of Health and the Ministry of Grenadine Affairs.**

- **Grenada:** “Develop a Policy and Plan for water resources management using IWRM principles”.

Lead Agency: **Land Use Division in the Ministry of Agriculture**

- **Singapore:** Formulation of the Singapore Green Plan 2012 to “ensure the sustainability of clean water supply”. Singapore, given its very limited water resources, has set as a national priority the development of a strategy for water security. This has led to the development of new recycling and desalination initiatives as well as to a comprehensive storm water runoff management system.

Lead Agency: **Ministry of Environment and Water Resources**

- **Talvern, Saint Lucia:** To improve water quantity and quality.

Lead “Driver”: **The Talvern Catchment Group**

The information generated from the stakeholder analysis can be used to develop a strategy for how best to engage different stakeholders in a project, how to ‘frame’ or present the message or information so it is useful to them, and how to maintain a relationship with them.

Conducting a well structured stakeholder analysis is key to the SIDS IWRM Planning Cycle. Quite often the wrong stakeholders or too many stakeholders are selected, and the process suffers from slow decision-making. While there is no rule on an appropriate number of stakeholders, the primary stakeholders should be limited and kept to those who can influence and help move the process forward. Other stakeholders identified can be brought in as and when necessary.

While gender sensitivity in the selection of the stakeholders is critical, the right type of stakeholders must be chosen. Female stakeholders should not be chosen just for the sake of their gender; they have to be chosen because of the value they will bring to the process (see Box 27).

Box 27. Additional gender-related questions to ask when determining stakeholders

- Have government institutions responsible for gender equality been consulted?
- Have women's organisations and gender equality advocates been consulted?
- Does the Lead Agency have the interest and capacity to deal with gender issues?
- Have there been discussions with organisations with an expertise in IWRM as to their interest and capacity in dealing with gender issues?
- Have efforts been made to ensure women's participation at all levels?
 - o In grassroots consultations?
 - o As water professionals?
 - o At all levels of government?

The choice of individuals representing the agencies is also very important. In some instances it will be necessary for individuals to be of a policy-making or executive level, while in other instances they can be of a technical level. All individuals must, however, be able to take decisions on behalf of their agencies or have good access to individuals who can make the necessary decisions.

(iv) Establishing a Facilitating and Coordinating Committee (FCC)

The most important stakeholders identified will constitute the Facilitating and Coordinating Committee (FCC), which has variously been referred in other IWRM programmes as the Steering Committee, Coordinating Committee, Task Force, etc.

It is important to involve the Ministry of Economic Planning and Development or other similar ministries with responsibilities for IWRM planning. Opportunities should also be provided for these ministries to educate and sensitise the FCC on the

Many National Apex Water Bodies (NWABs) in the Pacific lack a clear mandate and high-level endorsement and support, and as a consequence have problems with consistent commitment by members to keep driving the process forward.

national development planning cycle. This is particularly relevant for any strategies being planned at the national level.

Important considerations when Establishing an FCC

- The FCC must have a clear mandate, support and endorsement.
- The FCC can take many forms, build on existing structures, and can be combined with other committees as seen fit. It is important to use or to build on existing structures.
- One of the major challenges of SIDS is that there are often simply not enough people to undertake all the routine work that needs to be completed. The agencies that will be called upon to participate in a water sector programme are normally also involved in various other types of committees, and “burn out” from committee meetings is a real concern. Very often individuals in these committees expect to be paid to attend meetings and to be provided refreshments at the meetings. The Lead Agency has to either make sure that it has the funding to make such provisions or establish, from the very onset, what the rules of engagement will be.
- The FCC must have very clear Terms of Reference. The Committee, in most cases, will not have any executive power and its actions will require further review and endorsement by higher levels of government to allow for implementation. The Terms of Reference should be submitted for official government approval and support. Even an FCC established at the community level should have clear Terms of Reference which are accepted by the communities and endorsed by the Government agency which will work closely with the communities. (See Box 28).
- Members of the FCC, especially at the national level, should be appointed by, and be delegated the power to represent their respective institution (or organisation or department). Continuous representation by the same person is important in order to ensure consistency and progress.
- Members of the FCC at the national level should be high-level representatives of their institutions (directors or senior officers of departments) in order to facilitate and give weight to outcomes of deliberations of the FCC. However, institutions should be able to delegate specific technical or administrative FCC duties (e.g. participation in sub-committees or specific processes) to

The Solomon Islands established a National Steering Committee, which has its own terms of reference, to support the IWRM process; the government has provided a budget allocation for the IWRM process.

The Republic of Palau for example, has used an existing Water Safety Planning (WSP) Committee initially set up to support the implementation of their Water Safety Planning project to also include the functions of a National Water and Sanitation Committee tasked with driving the IWRM Planning process forward.

lower-level staff who report back to their directors.

- Signing a tripartite Memorandum of Understanding between the FCC Members and the Lead Agency will help to ensure that there is a clear understanding of the expected roles and responsibilities of each stakeholder.

Box 28. Recommended Terms of Reference for the Facilitating and Coordinating Committee (FCC)

The Terms of Reference should include

- An overview of the responsibilities and powers of the FCC:
- Core values and principles (e.g. transparency, accountability, equity, gender balance, etc.),
- Key areas of activity, structure and membership, structures and approaches for stakeholder engagement.
- Outline of administrative procedures for work planning, reporting, meeting arrangements, consultations, communications, information management and financing.

(v) Situation Analysis

A situation analysis is undertaken to contextualize and further clarify the issue that was identified as the entry point: It describes the problem or situation to be addressed. Essentially, it is an analysis of the context, independent of the specific stakeholders.

A situation analysis involves an analysis of the key factors affecting proposed targets, including direct threats, indirect threats, opportunities, and enabling conditions. Each factor can typically be linked to one or more stakeholders, namely those individuals, groups or institutions that have an interest in or will be affected by the proposed strategy.

Field experience has shown that a situation analysis for water resources should not take more than a month or two. In order to save time an initial step in performing a water-resources assessment is to specify the spatial and temporal boundaries of the entry point. Additionally, only the minimum information for the required decision should be collected; secondary information should be used wherever possible. Further experience has shown that a situation analysis can often be carried out in several steps of increasing complexity, with an initial 'back-of-an-envelope' assessment guiding subsequent, more detailed and focused information-collection (Box 29).

Different types of information will be collected depending on the entry point, the level of the proposed intervention (macro, meso, and micro) and the issue that has been identified for mitigation. Nevertheless, the data collected should generally reflect the following aspects of water resources:

- social (including gender);
- economic;
- environmental, including the relationship between water resources and other ecosystems, and the relationship between the uses and users of water throughout the entire hydrological system, including the receiving waters;
- technological; and
- political.

There also has to be some understanding of the institutional, policy and legislative framework within which the water resources are being managed and used.

Box 29. Some of the issues addressed in a situation analysis of water resources

- Policies, legislation and institutional frameworks specific to water resources management
- Mandate and responsibilities of agencies involved in any type of water resources management – water authority, water commission, department of agriculture, department of forestry, department of environmental health, etc
- Different types of water sources, water uses and water users
- Water supply and demand assessment
- Water quantity and water quality
- Environmental imperatives of water resources
- Social imperatives of water resources
- Linkages between water resources and other natural resources – land use, coastal and marine ecosystems, etc.
- Vulnerability assessments
- Types of financing available for the water sector
- Other policies and programmes which impact on the water sector

Step 2. Visioning

(i) Problem Tree Analysis

Visioning begins with a Problem Tree Analysis. This analysis helps to find solutions by mapping out the anatomy of an issue. It helps to clearly articulate the problem and to identify its causes and effects. This in turn assists in identifying different responses (scenarios) to mitigating the problem, and then selecting the best response or combination of responses.

When identifying the causes of the root problem, thought must also be given to the externalities that influence the water situation at the entry point.

The Vision should limit itself to a clear description of the desired future state for all water resources and services within the focus area (community, watershed, and nation).

The analysis can be undertaken by the Facilitating and Coordinating Committee in collaboration with the Lead Agency. The most suitable modality is a workshop with a professional facilitator. This workshop does not have to be more than three days long. The data generated in the situation analysis provides relevant background information for mapping out the causes and effects of the problem.

Box 30. Situation Analysis conducted by the Talvan Catchment Group for river bank stabilisation

- A description of the geophysical environment
- A hydrological assessment of the water catchment by way of a field reconnaissance of the river bank and map locations of degradation by GIS to establish nature of degradation along riverbank.
- Past and current land use practices
- Extent of watercourse degradation and its impact on water quality and water quantity through field reconnaissance and analysis of aerial photography
- Rainfall and water availability in the catchment
- Comparison of Talvan water quality and quantity against national water quality and quantity trends.
- Potential pollutant point sources within the watershed.

Based on an in-depth analysis of the current status of the water sector, the projected water demand and the research work already carried out in this field, a prioritised list of research proposals was identified with the ultimate aim of enhancing the water sector in Mauritius.

(ii) Objectives Tree Analysis

The analysis of objectives follows the problem analysis. Often the objective tree shows many objectives that cannot all be reached at once. Therefore, choices have to be made. Certain objectives may be unrealistic, too ambitious or not feasible within the context of a possible intervention, so other solutions will need to be generated.

Objectives of the same nature can be grouped into clusters. Clusters are made based on similarity of possible future activities, region or required expertise.

One (and often more) cluster will be chosen and used as the strategy to achieve a future desired situation. Based on a number of criteria, the most relevant and feasible strategy is selected. The criteria have to be chosen and agreed upon by all stakeholders.

After the Objectives Tree Analysis, the next steps are:

- Formulating a vision for the intervention
- Developing the logical framework
- Assessing and documenting assumptions and risks
- Defining targets and benchmarks
- Operational planning and budgeting, i.e. who does what and with what resources.

The Problem and Objective Tree Analyses help to develop a clear vision of the future, improved state of the water resource issue that was identified in the entry point.

Box 31. Examples of Possible Criteria to Use in Selecting Objectives

- Priorities of beneficiaries
- Donor policy
- Expertise and experience of implementing organisation
- fit with mandate of government authorities, national development plans, sectoral policies
- Duration of implementation
- contributions of different stakeholders
- Urgency - available human resources, institutions
- Contribution to overall goal and vision
- Available budget
- Inter-linkages between clusters
- Positive/negative side-effects
- Gender and social diversity aspects
- Sustainability - likelihood of success
- Fit with mandate of implementing organisation

Step 3. Strategising

Information generated during the Situation and the Problem Tree Analyses is used to identify likely scenarios for achieving the **Vision**. The scenarios developed are, in turn, used as a basis for identifying potential strategies and plans for achieving the vision. The vision proposed should be feasible and desirable in terms of equity, economic efficiency and environmental sustainability; and ones that can be achieved without further burdening the existing institutional and organizational framework.

(i) Scenario Development

Scenario development provides the Lead Agency and the FCC the opportunity to collaboratively, first identify a number of scenarios for achieving the vision and then, based on further brainstorming, to identify the best out of a number of scenarios²—based on the critical drivers—that will achieve the vision. The best scenario is then used to develop the strategy that will mitigate the issue(s) that were identified in the entry point.

Scenario planning is about assessing and evaluating a problem from different perspectives and collectively with all stakeholders. It is also about developing options and then choosing the best one/s. Scenario development is a six-step process which includes strategy preparation and plan preparation.

²There can be a number of best scenarios

Box 32. Scenario Development

Identifying what is driving the vision (generally grouped into social, technological, economic, environmental, including climate variability/change and vulnerability, and political)— usually referred to as “external factors”.

- Deciding which of the drivers are critical but uncertain – referred to usually as the internal or local factors
- Constructing a scenario matrix
- Developing the scenarios
- Evaluating the scenarios
- Choosing the scenario which will best deliver the vision.

Box 33. The Samoan Water Sector Policy

Samoa had identified five objectives/scenarios to achieve the vision for the water sector. Different Strategies were developed for each of the scenarios. In the case of the scenario to strengthen water sector governance and orientation, six different strategies were identified. The Samoan Water Sector Policy includes strategies for each of the scenarios that were identified. Included in the document is a responsibility matrix identifying roles and responsibilities of government, civil society groups and NGOs, and the private sector. The document also includes a section on resource requirements and another section on monitoring and evaluation.

(ii) Strategy Preparation

Broad, “back-of-an-envelope” strategies are developed for each scenario. The various scenarios and strategies are compared and evaluated. A ‘most likely’ scenario is then identified and used as the basis for developing more detailed strategies.

Normally, the strategies cannot all be implemented at the same time. Therefore, the strategies are prioritized according to a checklist, in order to identify those that can be implemented in the short-term without significant additional resources.

Implementing short-term priorities gives the Lead Agency and FCC sufficient time to mobilize the necessary resources for the other components of the Strategy without losing momentum. In the case of the Samoa Water Sector Policy, activities were identified for the short-term (3–5 years) and medium- to long-term (more than 5 years).

Some activities identified in the Strategy may best be undertaken through regional approaches. These include training; preparation of harmonized policies and legislation; and resource mobilization.

Even if activities are removed from the national strategies, there may be elements of the regional approaches that will require national implementation. These activities must be included in the strategy and in implementation plans.

Step 4. Planning

(i) Plan Preparation

Once the best strategies for each of the scenarios have been chosen, then an implementation plan is drawn up. Creating the action plan involves:

- Designing major programs of activities to achieve the objectives and goals, possibly with a multi-year horizon.
- Developing a viable budget as part of the action plan.
- Identifying activities and interventions that are affordable, practical, and timely.

The Action Plan must assign responsibilities and identify the necessary resources, with timelines. Most importantly, the Action Plans must be reviewed regularly and revised accordingly.

Some points worth noting:

- All stakeholders should be informed of the Plan. It is best to communicate directly rather than to upload the Plan on to a website
- The Plan must identify funding strategies, a communications programme, a programme and budget for capacity building activities, and a monitoring and evaluation programme.
- A good monitoring and evaluation (M&E) system can make the difference between an IWRM plan that has an impact on the ground and one that remains merely an expression of good intentions.

The Plans will have budgetary and legal implications and proposal documents setting out the required changes and likely costs should be included in the plan. Final action plans need political approval at the highest level; acceptance from the main stakeholders; and the necessary financial resources from domestic and international sources.

The planning has to be followed rapidly by implementation in order to become useful. The planned changes in institutional structures, human resource development, improved knowledge and a capability to use the appropriate management instruments will have to be implemented together with changes flowing from improvements in water resources management and in water services delivery.

Step 5. Implementation

Requisite activities during implementation include

(i) Administrative and financial management, including

- the preparation of annual work plans and budgets,
- regular reporting of the status of implementation
- record keeping,
- application of sound procurement principles, and
- regular budget and expenditure analyses.

(ii) **Capacity Development**, i.e. strengthening the capacities of those agencies that will implement elements of the Action Plan.

(iii) **Institutional strengthening**. The capacity of the agencies to plan and manage the Strategies and Action Plans must be assessed and included in the Action Plans.

(iv) **Strengthening of the enabling environment**. For the interventions to be effective, it may be necessary to recalibrate policy and legal instruments for water resources management.

(v) Data collection and monitoring

Step 6. Monitoring & Evaluation and Documentation

A strong monitoring & evaluation system helps ensure that an IWRM strategy meets its main objective of fostering positive change, and also that the strategy can adapt to evolving needs and conditions.

(i) Monitoring and Evaluation

The Monitoring and Evaluation (M&E) Plan identifies:

- Which indicators are to be used
- Who will collect them
- Where they will be collected
- How frequently they will be collected
- Collection/measurement methods
- Means of verification – e.g. meetings minutes, data sheet, field reports, etc.
- Reporting and dissemination
- Response/Action.

The M&E process must also include sex-disaggregated indicators. Stakeholders need to be involved in M&E in order to ensure that the assessment is accurate. In addition, assessment can be a powerful tool for mobilizing support for the implementation process when it is going well or for prompting a change of direction when needed. Involving women is critical to obtaining an accurate picture of the degree to which the interventions are actually achieving their development goals and ameliorating (rather than entrenching) social and economic inequities.

The human and financial resources required for M&E need to be considered and factored into budgets and capacity-building needs.

An often-neglected aspect of M&E is communicating results to stakeholders—this includes those directly involved in implementing the strategy as well as the general public. Regular stakeholder communication can help mobilize support for the strategy and increase accountability. Effective communication means packaging information in a way that is readily understandable to the target group and that addresses their needs or concerns.

(ii) Documentation and Lessons learned

A final but important component in the SIDS IWRM Planning Cycle is reporting and identifying lessons learned and best practices. The experiences of one intervention must feed into the development of new interventions. And the lessons learned from interventions at the micro and meso levels should feed into the refinement of policies and legislation at the macro level.

Additional Components of the SIDS IWRM Planning Cycle

There are two additional components that are integrated into the SIDS IWRM Planning Cycle. These are **awareness and sensitisation**, and **climate change considerations**, all of which are embedded into all phases of the cycle.

(i) Awareness and Sensitisation

Every Step in the Cycle has an “awareness” component which must be completed if the programme is to be successful (Table 2.1). The awareness-raising programme for each step in the Cycle varies and caters for different groups of stakeholders.

Field experience has shown that public awareness and sensitisation requires skilled persons who are often not available within the staffing complement of most resource management agencies. The Lead Agency may therefore have to outsource such skills for the entire duration of the intervention. Indeed, it may be useful if these skills can be acquired from Phase 1 of the planning cycle.

Funding, however, is usually inadequate, and consideration should be given to “borrowing” from or “piggy-backing” on those agencies in the FCC who have budgets for public awareness and sensitisation programmes. Agencies which implement Multilateral Environmental Agreements (MEAs) usually receive funding from the respective MEA Secretariats for public awareness programmes.

Box 34. New Bus Drives Home Water Message



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The Integrated Water Resources Management (IWRM) message has gone mobile in Fiji, with the launch of a bus with the message ‘Water is Everybody’s Business’ running down the length of one side.

The 10-by-2-metre image depicts activities being carried out by a Global Environment Facility (GEF)-sponsored IWRM demonstration project in the Nadi Basin, and aims to raise awareness of the need for an integrated approach to improve water management and reduce risks from flooding.

Box 35. Connecting the Dots. Caribbean Journalists Sensitised to Watershed and Marine Conservation Issues by the IWCAM project



Identifying coral from a glass bottomed boat

GEF IWCAM Newsletter Vol. 5 Issue 2
June 2011



Journalists on fieldtrip

GEF IWCAM Newsletter Vol. 5 Issue 2 June 2011

Table 2.1. Types of awareness activities for each step in the SIDS IWRM planning cycle

Steps in Planning Cycle	Types of Awareness Activities	Stakeholder Groups
Identifying an entry point	Sensitisation of the general public about the intention to launch a programme in the water sector	• General Public
	Sensitisation of senior management of Lead Agency	• Staff and Management of Lead Agency
	Sensitisation of agencies who will form the stakeholder network for the intervention.	• Stakeholder agencies
	Sensitisation of FCC on purpose of initiative and IWRM principles	• FCC
1. Diagnosing	Memos, flyers to agencies who own information critical for situation analysis	• Relevant Government agencies, private sector agencies and civil society groups
	Electronic circulation of Summary Report of findings of situation analysis	• Lead Agency, FCC, other relevant stakeholders in network
	Summary Information Report uploaded on to website of Lead Agency and websites of agencies represented on the FCC	• General Public
2. Visioning	Circulation of Workshop Report to management of Lead Agency	• Management of Lead Agency
	Circulation of Workshop Report to agencies represented in FCC	• Members of FCC and • Management of agencies represented in FCC
	Community presentation, where appropriate	• Community groups if intervention is at meso or micro levels
	Short statement on Vision uploaded onto Lead Agency’s website and on websites of agencies represented on the FCC	• General Public
3. Strategising	Workshop Report	• Management of lead Agency and agencies represented in FCC
	Presentations	• FCC • Other stakeholders in network • Staff of lead Agency and agencies represented in FCC
	Communication through media	• General Public
4. Planning	Workshop Report	• Management of Lead Agency and agencies represented on FCC
	Presentations and Consultations	• Agencies who will be responsible for implementing Plan
	Presentations	• Staff of Lead Agency and Agencies represented on FCC • Other Stakeholders in the network

Steps in Planning Cycle	Types of Awareness Activities	Stakeholder Groups
	Summary Plan uploaded on website of lead Agency and agencies represented on the FCC	<ul style="list-style-type: none"> • General Public
	Communication through media	<ul style="list-style-type: none"> • General Public
	Community Consultations	<ul style="list-style-type: none"> • Community groups where appropriate
5. Implementation	Regular Reports (Programmatic and Financial)	<ul style="list-style-type: none"> • Members of FCC • Management of Lead Agency and agencies represented on <ul style="list-style-type: none"> • FCC; donor agencies where appropriate
	Summary of Technical Reports uploaded on website of Lead Agency and agencies represented on FCC	<ul style="list-style-type: none"> • General Public • Communities, where appropriate
6. Monitoring & Evaluation and Documentation	Regular M&E Reports	<ul style="list-style-type: none"> • Members of the FCC • Management of Lead Agency and agencies represented in FCC • Donor agencies, where appropriate, • Community groups where appropriate
	Reports on lead Agency's website and websites of agencies in the FCC	<ul style="list-style-type: none"> • General Public
	Summarised media reports	<ul style="list-style-type: none"> • General public

(ii) Climate Change and Climate Variability

SIDS will experience some of the earliest and most severe consequences of climate change over the next two centuries^{3,4}. While the popular press has focused on the threat of inundation of island coastal areas by rising sea levels, perhaps the most critical near- and long-term threat to SIDS is the possible impacts of climate change on freshwater quality and availability^{5,6}.

While IWRM has been viewed as a good tool for climate adaptation, the potential impacts of climate change and increasing climate variability are not sufficiently addressed in the current generation of IWRM plans^{7,8}.

3 Intergovernmental Panel on Climate Change. 2001a. *Working Group II to the Third Assessment Report, Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge University Press, Cambridge, pp. 854–855.

4 Burns, W.C.G. 2001b. "The possible impacts of climate change on Pacific island state ecosystems." *International Journal of Global Environmental Issues*, Vol. 1, No. 1, p. 56.

5 Meehl, G.A. 1996. "Vulnerability of freshwater resources to climate change in the tropical Pacific region." *Water, Air and Soil Pollution*, Vol. 92, pp. 203–210.

6 East-West Center. 2001. *Pacific Island Regional Assessment of the Consequences of Climate Variability and Change*. East-West Center, Honolulu, Hawaii, Chapter 2, p. 27.

7 Kabat, P; R.E. Schulze, M.E. Hellmuth, J.A. Veraart and Roberto Lenton, 2003. *Climate Variability and Change and Freshwater Water Management. International Review for Environmental Strategies* 3(2): 294-302.

8 Kabat, P, and H. van Schaik, (co-ordinating lead authors), 2003. *Climate changes the water rules: How water managers can cope with today's climate variability and tomorrow's climate change*

Given the increasing threats to water resources that are likely to occur by the end of this century (2070 – 2100) and beyond as a consequence of climate change, there are a number of climate-change adaptation strategies that could be considered by SIDS, to protect and conserve freshwater resources. Among the strategies⁹ are the following:

- A comprehensive assessment of current water demand and projections of future demand needs.
- A sustained research program to assess available fresh water resources.
- More attention on the impacts of development projects, including tourism infrastructure, on the vulnerability of coastal freshwater resources.
- More attention on controlling leaks from existing water systems. Leakage-control programs in nations such as the Seychelles, Malta, and the Bahamas have substantially reduced water loss¹⁰.
- .
- Appropriate financial and human resources channeled to national and regional meteorological institutions that are responsible for collecting and analysing climate data.

When and How to Incorporate Climate Change into the SIDS IWRM Approach

Water is the first sector to be affected by change in climate. Climate change leads to an intensification of the hydrological cycle, which leads to serious effects on the frequency and intensity of extreme weather events. Sea level rise, increased evaporation, unpredictable precipitation and prolonged droughts are just a few manifestations of climate change that are directly impacting on the availability and quality of water.

By managing water resources at the most appropriate level, and facilitating all stakeholders' participation in management and policy development (ensuring that the most vulnerable groups are considered), IWRM directly helps communities cope with climate variability.

IWRM makes it easier to respond to changes in water availability. Risks can be better identified and mitigated in the process of watershed planning. When action is needed, stakeholder participation helps to mobilize communities and generate action. Water users can be stimulated to use the resource sustainably in the face of changing conditions.



Water resources on atoll islands like South Tarawa in Kiribati are being affected by climate variability and change.

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Technicians from St. Kitts. Water agencies in SIDS are working to address increasing demand and the challenges of climate change.

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⁹Adapted from Burns, William C.G. 2000. *Pacific Island Developing Country Water Resources and Climate Change*. Pacific Institute for Studies in Development, Environment, and Security: Oakland, CA

¹⁰United Nations Environment Programme (UNEP). 1998. *Source Book of Alternative Technologies for Freshwater Augmentation in Small Island Developing States*. UNEP, Nairobi, Kenya.

Table 2.2 provides guidance on how climate change dimensions can be integrated into the SIDS IWRM planning cycle.

Table 2.2 Integrating climate change dimensions into the SIDS IWRM planning cycle

STEPS IN IWRM SIDS APPROACH	CLIMATE CHANGE DIMENSIONS
	<ul style="list-style-type: none"> Note: Climate change adaptation is an additional element, not a replacement of IWRM goals.
DIAGNOSING	
Stakeholder Analysis	<ul style="list-style-type: none"> Stakeholders to be analysed should include Hydrological and Meteorological Agencies, local weather stations
Establishing a Coordinating and Facilitating Committee	<ul style="list-style-type: none"> Include the agency (ies) responsible for generating climate data and information; should also consider co-opting agencies that are responsible for implementing climate change convention and/or have access to climate information and models
Situation Analysis	<ul style="list-style-type: none"> Incorporate climate information and impact analysis, including: climate data – particularly rainfall and other typical and special climate data sets, where available. Identify known climatic conditions affecting geographical scope and issues in the “entry point.” If appropriate, conduct a participatory vulnerability to current climate variability and extreme events and of areas where risks would increase due to climate change
VISIONING	
Problem Tree Analysis	<ul style="list-style-type: none"> Consider the causes and effects of climate variability and climate change on the root problem. Consider the issues influencing the vulnerability of the root problem.
Objective Tree Analysis	<ul style="list-style-type: none"> Consider incorporating relevant issues of climate change vulnerability and adaptation into the objective(s)
PLANNING	
Scenario Development	<ul style="list-style-type: none"> Review applicable climate change scenarios if available and accessible. Identify key adaptation measures to be used in each scenario. The selection of scenarios and related methodologies and measures to deal with adaptation to climate change should take into consideration possible side effects of their implementation. Review adaptation measures articulated in Country’s National Communications; Vulnerability Assessment Reports and National Adaptation Plans.
STRATEGISING	
Action Plan and Budget	<ul style="list-style-type: none"> The four major methods used for prioritizing and selecting adaptation options are cost-benefit analysis, multi-criteria analysis, cost-effectiveness analysis and expert judgement. The Plan should include the roles of the various stakeholders in incorporating the implementation of adaptation strategies and their training and capacity development needs to take up responsibilities in addressing climate change adaptation.
M&E/DOCUMENTATION	
	<ul style="list-style-type: none"> Results must be measured against indicators, taking into consideration the adaptation measures proposed in the plan. The indicators should include: <ul style="list-style-type: none"> Impact: the extent to which the intervention reduces climate vulnerability and/or enhances adaptive capacity (through bringing about changes in adaptation processes: policy making/planning, capacity building/awareness raising, information management, etc.) Sustainability: the ability of stakeholders to continue the adaptation processes beyond the intervention’s lifetime, thereby sustaining development benefits.

SECTION 3

Toolkit for the SIDS IWRM planning cycle

This section provides practical guidance (tools) to be used in carrying out the various phases of the SIDS IWRM Planning Cycle described in Section 2. These include the identification of an 'entry point', diagnosing, planning and strategizing, through to the development of detailed implementation plans, monitoring & evaluation, and communication. These tools provide the platform on which to build the SIDS IWRM Planning Approach.

Additional tools for IWRM planning are available online and in general IWRM Guidelines—many of these resources are listed at the end of this section.

Materials and Resources

The main activities related to each step in the SIDS IWRM Planning Cycle usually take place within a workshop setting, so a number of workshop resources are required. These include index cards, flipcharts, and markers. Specialist support by way of a good facilitator is also necessary.

Workshops provide an excellent platform for promoting dialogue, and stakeholders often get a strong sense of achievement from well-facilitated workshops. The choice of participants for these workshops is, however, very important. The number of workshops will depend on the number and the experience of the stakeholders.

Sometimes, semi-structured interviews may be used to obtaining information. A checklist of key questions ensures that the interviewer covers essential areas, but has the flexibility to follow-up on areas not covered by the checklist. Such interviews are normally undertaken by the Lead Agency or members of the facilitation team working together with representatives of the stakeholders. The trick with these semi-structured interviews is to write up the report no more than 24 hours after the interview is conducted, while the information is still fresh.

Experience shows that a facilitation team made up of representatives from the Lead Agency and the Facilitation and Coordination Committee (FCC) can help to move the processes through the Planning cycle. In some instances, individuals from outside these agencies may have to be brought in as part of the facilitation team. This team must be small (no more than 3 to 4 persons) and must be made of persons who are knowledgeable in IWRM issues or in facilitation procedures and project management principles.

In the initial stages, the stakeholders are new to the approach and require considerable help from the facilitation team; the team should work with the stakeholders over an extended period and become knowledgeable about the issues, concerns, and dynamics among the stakeholders.

This Toolkit is organised as follows:

- Stakeholder Analysis
- Situation Analysis
- Problem Tree Analysis
- Objective Tree Analysis
- Visioning
- Scenario Building
- Preparation of a Strategy
- Preparation of an Action Plan
- Implementation
- Monitoring and Evaluation
- Documentation
- Communications
- Gender Mainstreaming
- Ecosystems Approach
- Further Resources

Stakeholder Analysis

Stakeholder analysis is the identification of the key stakeholders in the Analysis and Planning stage of a change process, and an assessment of their interests and the way in which these interests are likely to affect the process.

Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. **Secondary stakeholders** are the intermediaries. This definition of stakeholders includes both winners and losers and those involved or excluded from decision-making processes. Key stakeholders are those who can significantly influence, or are important to the success of an intervention.

Stakeholder analysis helps analyse whom to involve in what way in the Planning Cycle (and perhaps in the change-implementation process). A key question in stakeholder analysis is:

“How should participation in the analysis and planning process be designed, in order that this process yields the optimal combination of relevant, realistic objectives and commitment from the key stakeholders?”

The first step is to clarify the issue that has been identified as the **entry point**, and then to identify all the stakeholders or interest-groups associated with this problem or issue. The question to ask here is:

“Which stakeholders (organizations, groups and individuals) are relevant in the water sector of the specific issue or geographical area identified in the entry point?”

Box 36. Checklist for Identifying Stakeholders

- Have all primary and secondary stakeholders been listed?
- Have all potential supporters and opponents of the intervention been identified?
- Has gender analysis been used to identify different types of female stakeholders (at both primary and secondary levels)?
- Have primary stakeholders been divided into user/occupational groups, or income groups?
- Have the interests of vulnerable groups (especially the poor) been identified?
- Are there any new primary or secondary stakeholders that are likely to emerge as a result of the proposed intervention?

Box 37: Example of a Stakeholder Table

Stakeholder	Interest	+ ve /- ve
Water Authority	Provision of increased services	+ve
Women in Community	Delivery of potable water to standpipes close to village	+ve
Government Officials	Success of Intervention in water sector	+ve

A small group of about six to eight people, from the Lead Agency and some other body/ies familiar with a varied perspective on the problem, should be enough to create a good brainstorming session. Stakeholders can be organisations, groups, departments, structures, networks or individuals, but the list needs to be pretty exhaustive to ensure nobody is left out. Then organise the stakeholders in matrices according to their interest and power (Table 3.1). 'Interest' measures to what degree they are likely to be affected by the research project or policy change, and what degree of interest or concern they have in or about it. 'Power' measures the influence they have over the project or policy, and to what degree they can help achieve, or block, the desired change.

Table 3.1 Table of Influence

Stakeholder	Importance	Power (Influence)
Water Authority	5	5
Women in Village	5	1
Government Officials	3	5

Scale of 1 to 5 with 5 being the highest

It is important to fully engage and bring on board stakeholders with high power, and interests aligned with the project. These stakeholders form the Facilitation and Coordination Committee (FCC). Stakeholders with high interest but low power need to be kept informed but, if organised, they may form the basis of an interest group or coalition which can lobby for change. Those with high power but low interest should be kept satisfied and ideally looped in as patrons or supporters of the proposed policy change.

Once the stakeholders who will constitute the FCC have been identified, additional questions to ask are:

- What are the objectives of these stakeholders? Is there a shared objective?
- What are the main problems each of these stakeholders perceives within the domain of the water sector?
- Who should be considered a key stakeholders and who should not?
- What are the actual information flows among the stakeholders? What relevant information/ knowledge networks do the stakeholders already utilize? In what areas?
- What is the actual power and decision-making situation among the stakeholders? How could/ need this be improved?

Table 3.2 Importance/influence matrix

High Importance/Low Influence	High Importance/High Influence
A	B
C	D
Low Importance/Low Influence	High Importance/Low Influence

Interests of all types of stakeholders may be difficult to define, especially if they are “hidden”, or in contradiction with the openly stated aims of the lead agency and other agencies involved in the water sector. A rule of thumb is to relate each stakeholder to either the issues identified at the entry point (if at an early stage of the intervention), or the established objectives of the intervention (after Step 2 in the SIDS IWRM Planning Cycle). Interests may be drawn out by asking:

- What are the stakeholder’s expectations of the intervention?
- What benefits are there likely to be for the stakeholders?
- What resources will the stakeholder wish to commit (or avoid committing) to the project?
- What other interests does the stakeholder have that may conflict with the project?
- How does the stakeholder regard others on the list?

The final step is to develop a strategy for how best to engage different stakeholders in the various phases of the project; how to ‘frame’ or present the message or information so it is useful to them; how to maintain a relationship with them (such as who will make each contact and how; what message they will communicate; and how they will follow-up).

A Participation Matrix is used to indicate the types of participation (from being informed about the activity to actually controlling it) of key stakeholders at different stages of the SIDS IWRM Planning Cycle (Table 3.3).

Table 3.3 Participation Matrix

Steps in Planning Cycle	Inform	Partnership	Consult	Control
Diagnosing				
Visioning				
Strategising				
Planning				
Implementation				
M&E and Documentation				

Situation Analysis

The primary aim of a situation analysis is to identify the causes of the water-related issue that was identified as the entry point. The purpose of this step is to help characterize the present situation and to use the information to predict future adjustments necessary for an IWRM approach. The situation analysis examines the key factors of influence in a given situation. It is especially important to view the situation first from the perspective of those directly affected. Awareness of the problems and the motivation to seek solutions depend on the experiences of the stakeholders.

The situation analysis tool is used to assemble information to ensure that all stakeholders have access to good quality information that can be used for decision making. Working with stakeholders, the initial steps are to:

- Specify spatial and temporal boundaries for information collection. The spatial boundaries can be an entire island, a watershed or a village. The temporal boundaries are time limits for considering key trends. The focus may be primarily at one level—e.g. a watershed or catchment—but it is important to collect information on activities that are taking place above and below that level. Such information will help make judgments on upstream–downstream linkages, relationships between ecosystems within the hydrological system and between other ecosystems and the water resources.
- Identify national plans, policies, legislation and strategies that impact on the water sector.
- Specify details about the type of data required – degree of disaggregation (e.g. by gender), level of precision, scale of maps, etc.
- Identify easily accessible secondary sources of information and then decide what other primary data is needed to fill the gaps and to bring the information up to date. A word of caution: Field experience shows that the secondary data can often be wrong or outdated, and needs to be verified.
- Decide on level of specialist support, if applicable and necessary, and analytical tools that may be needed.

The situation analysis must also include a capacity analysis of the agency that will most likely lead the process. The SIDS IWRM Planning Cycle refers to this agency as the Lead Agency. The capacity assessment should include a policy dimension, a legal and regulatory dimension, a management dimension and a resources dimension.

There are several related principles for coordinating the collection of knowledge:

- Multi-stakeholder groups should design the information gathering, analysis and research process themselves, to ensure **ownership** of the strategy and its results.
- All the ‘analysis’ tasks are best implemented by bringing together, and supporting, *existing* centres of technical expertise, learning and research.
- Since analysis is central to strategy development, it should be **commissioned, agreed and endorsed at the highest level** (i.e. by key government ministries or by the FCC). This will increase the chance that analysis will be well focused and timely in relation to the plan’s evolution and timetable, and that it will be implemented.
- In the same way, analysis needs **good coordination**. It is logical for the FCC to coordinate the analysis but it should not undertake all the analyses itself and, indeed, not necessarily any of it. Many players need to be involved. Through their active involvement in reflection and analysis, the strategy will help in building learning institutions.
- The understanding of the **terrestrial and aquatic ecosystems** is an essential element of resource assessment. A sound water resources assessment needs to be based on good physical and socio-

economic data. However, often these data are not available and this in itself is an indicator of the weakness of the water resource management system.

A comprehensive water resources assessment is a good investment, but it is a big undertaking. Consequently, the knowledge needs should be prioritised, initially focusing on those topics directly related to the entry point. Frequently, the knowledge needed for strategic development and decision-making exists only in an *ad hoc* form among professionals and practitioners within water resources and water-related sectors.

It is highly desirable that all stakeholders, especially those in the FCC, participate actively in the situation analysis. It is also important that all other stakeholders be informed of the process. Once the information has been collected and analysed, it must be packaged and shared with the stakeholders. Different stakeholders will require different types of information and different packaging of that information.

The situation analysis report should adequately reflect the concerns and impacts of the present water management systems on users, development, the environment and society as a whole. The report should be shared widely and summarised as appropriate. The report should serve as an important indicator of the transparency of the process and the commitment of government to address the issue of sustainable management of water resources. The sharing of the report with politicians and other senior members of government helps to maintain political commitment, enlist their support for the solutions and actions emerging, and create awareness of the implementation implications of the forthcoming strategy and intervention.

All the Pacific island countries have completed National Integrated Water Resources Management diagnostic reports. The objective of these reports is to:

- Provide a summary of IWRM needs, issues and current initiatives for the country.
- Collate information related to water and wastewater in the country for future use by the National IWRM Focal Point and SOPAC.
- Provide a reference document on the state of IWRM on each island.

Key Points to Consider

Getting stuck in data collection – Collecting a huge amount of data is time consuming and often unnecessary. The basic situation and trends often become sufficiently clear without the need to achieve ‘100% information coverage’.

Meeting resistance from sources of information – Resistance to the provision of information can come from within or outside the administration and is typical where people are unaware of the reasons behind the collection of information. Involving ‘owners of knowledge’ actively in the IWRM process can help to overcome resistance.

Poor quality information – The collection of information is in vain if it is not accurate enough for use. All collected data should be validated and a wide range of sources used when gathering information.

Preventing access to gathered information – Once the information has been collected it should not be “hidden”. Everyone should have access, including institutions and government departments as well as the general public.

Water users are experts – The local community is a valuable source of information and their knowledge should be fully utilised. Water users are as important as water specialists or consultants as source of information about water resources.

The report for Cook Islands covers three aspects of IWRM: water supply; treatment of wastewater and water quality in the freshwater and marine environments. In covering these three elements, issues of land use, human impact on the environment, and ecosystem services are covered. The information in the report was derived from interviews with key stakeholders and previously written reports and scientific papers.

The Papua New Guinea report describes the current situation and constraints with respect to the occurrence, uses and management of water resources in the country, and proposes remedial measures aimed at ensuring the sustainable utilisation of the available water resources in order to achieve human well-being and maintain environmental integrity.

Table 3.4 Key tasks in conducting a Situation Analysis

Key Tasks	Description
Compilation of a list of information sources	Drafting a list of institutions, organisations and any other sources that might provide useful information for carrying out a baseline assessment.
Collection of secondary information	Collection of information that is already available from the archives and data stores of all Government departments as well as from identified external institutions and organisations. This should provide a good understanding of the current water resources situation both physically, in terms of quality, quantity and patterns of demand, and legally, with regard to legislation and policy.
Collection of primary information	Collection of information through, for example, investigations to fill information gaps on the local infrastructure and water environment, and discussions with the local community to highlight existing concerns, such as health problems, that might be related to local water resources.
Storage of information	Ensuring that information is properly documented and stored in a systematic and structured way. Ideally this should be done in an electronic database. However, it is also possible with a well-organised and maintained paper filing system.
Providing access to information	Providing all the stakeholders and other government departments with easy access to the compiled information and, externally, allowing civil society to benefit from the growing amount of knowledge.
Media and public relations work	Announcing the intention to carry out a baseline assessment in order to raise public awareness of the reasons for the collection of information and to encourage people to get involved. Use of multimedia to disseminate summarised information generated from the situation analyses, so that the public is informed of the data that was collected and analysed.

Problem Tree Analysis

Problem tree analysis helps to find solutions by mapping out the anatomy of cause-and-effect around an issue. The problem is broken down into manageable and definable chunks. This enables a clearer prioritisation of factors and helps focus objectives. There is also more understanding of the problem and its often interconnected and even contradictory causes.

Problem tree analysis is best carried out in a small focus group of about six to eight people using flip chart paper or any other available technology. It is important that factors can be added as the conversation progresses.

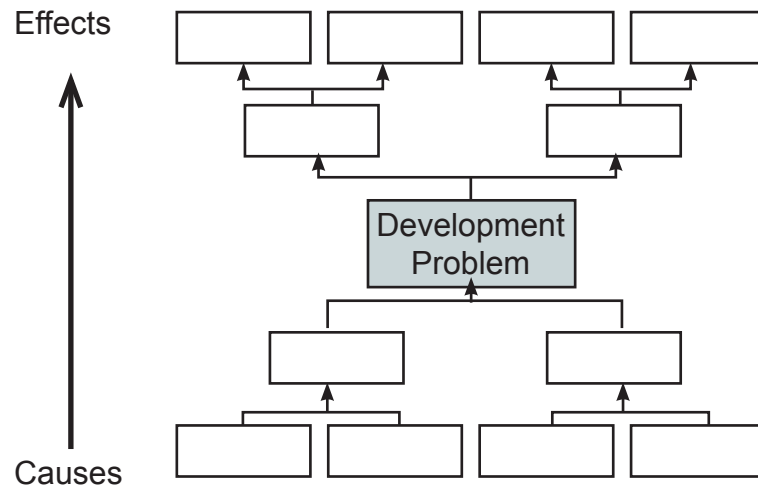
Steps in Problem Tree Analysis

The first step is to discuss and agree the problem or issue to be analysed. Do not worry if it seems like a broad topic because the problem tree will help break it down. The problem or issue is written in the center of the flip chart and becomes the 'trunk' of the tree. This becomes the 'focal problem'. The wording does not need to be exact as the roots and branches will further define it, but it should describe an actual issue that everyone feels passionately about.

Next, the group identifies the **causes** of the focal problem - these become the roots - and then the **consequences**, which become the branches. These causes and consequences can be written on Post-it notes or cards, perhaps individually or in pairs, so that they can be arranged in a cause-and-effect logic. The heart of the exercise is the discussion, debate and dialogue that is generated as factors are arranged and re-arranged, often forming sub-dividing roots and branches (similar to "Mind map"). Take time to allow people to explain their feelings and reasoning, and record related ideas and points that come up on separate flip chart paper under titles such as "solutions", "concerns" and "decisions". See Annex 9 for an example of a problem tree.

Developing a Problem Tree

- Brainstorm suggestions to identify the focal problem and write it on a card or 'Post-It' stickers.
- Brainstorm all of the related problems to the focal problem and write each problem on a separate card (or a Post-It stickers).
- Establish a hierarchy of causes and effects - problems that are directly causing the focal problem go below it, and problems that are effects of the focal problem go above.
- For each problem ask the question 'What causes this problem?' Write the causes on separate cards and place them below the problem they cause. If there are two or more causes of a problem, and one is not the cause of the other then place them on the same level.
- Review the problem tree for completeness and accuracy and connect the problems with cause-effect arrows/lines to show the links



Discussion questions might include:

- Does this represent the reality? Have the economic, political and socio-cultural dimensions to the problem been considered?
- Which causes and consequences are getting better, which are getting worse and which are staying the same?
- What are the most serious consequences? Which are of most concern? What criteria are important to us in thinking about a way forward?
- Which causes are easiest / most difficult to address? What possible solutions or options might there be? Where could a policy change help address a cause or consequence, or create a solution?
- What decisions have we made, and on what actions have we agreed?

The **Problem Tree** is closely linked to the **Objectives Tree**, another key tool in the project planner's repertoire, also commonly used by development agencies. The Problem tree can be converted into an objectives tree by rephrasing each of the problems into positive desirable outcomes—as if the problem had already been treated. In this way, root causes and consequences are turned into root solutions, and key project or influencing entry points are quickly established.

Key points to remember:

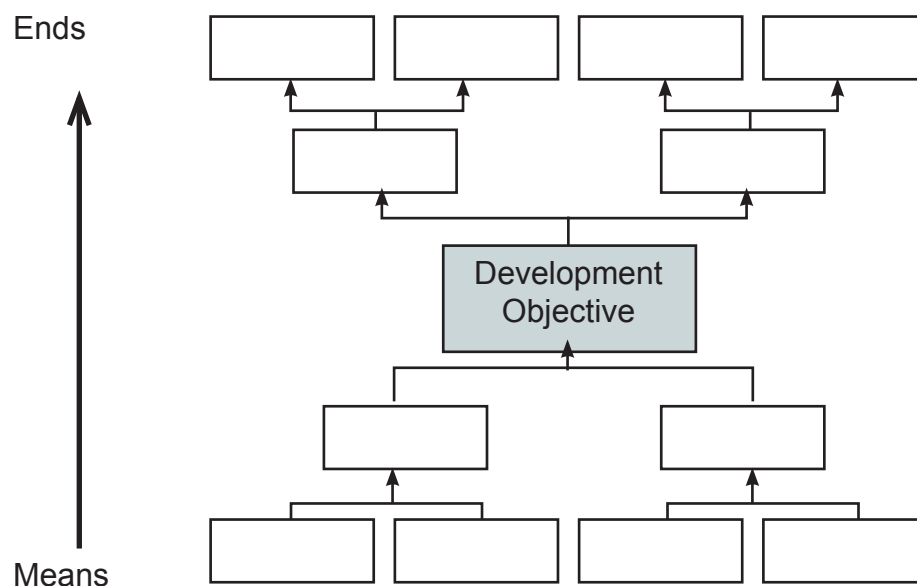
- The quality of the problem tree will depend on involving the right people.
- It may be best to run separate problem-analysis workshops with different stakeholder groups.
- The process is as important as the product and should be seen as a learning and relationship-building experience.
- The problem tree should be a valid but simple representation of the current negative situation.
- Don't try and cover every cause of every problem identified; concentrate on the most important ones.

Objectives Tree Analysis

The problems identified in the problem tree must now be transformed into objectives, i.e., future solutions of the problems. The analysis of objectives describes the desired situation after the problems have been resolved; the key analytic tool for doing this is the **Objectives Tree**.

Objectives analysis (i) describes a situation after the problems have been resolved, (ii) identifies the means-end relationship, and (iii) visualizes the means-end relationship in a diagram referred to as an “objectives tree”.

Steps in developing an Objectives Tree



The objectives analysis and the formulation of the objectives tree involve the following steps:

Step 1: Reformulate the development problem at the highest level of the problem tree into a positive desirable condition or **objective**. Objective statements should be realistically achievable. Do not simply rewrite a negative expression into a positive one; framing a solution mechanically is not likely to lead to a strategically sound intervention.

Step 2: Write the potential direct means for achieving the core objective on cards and place them in a horizontal line under the core objective. Start by analyzing the problem statements, convert them into objectives, omit them or add additional objectives, as appropriate.

The Objectives Tree is used to generate the desired outcome as required outputs as well as the intended impact

Step 3: Revise the objectives statements if necessary. Add new objectives statements if these appear relevant and necessary to achieve the stated objective at the next higher level.

Step 4: Repeat step 2: determine the means for achieving each of the objectives above (direct means) and place them in a horizontal line under each card. The number of objectives is not restricted to the number of problems identified in the problem tree.

Step 5: The space above the core objective is for objectives that flow directly from the core objective. Examine each statement and convert it into a positive, desirable statement.

Step 6: Repeat step 5: determine the direct objective for the objective statements below it.

Step 7: Review the objectives, checking that all means-ends relationships are valid and that there are no means-ends relationships missing. Complete the objectives tree by connecting the cards with lines.

Key points to remember:

- The quality of the objectives tree depends largely on the quality of the original problem tree. Bear in mind that the original problem tree was the product of a consensus of opinions, and that the problem statements and cause-effect links should have been verified prior to its finalization.
- If the logic of the first draft of the objectives tree is patchy, return to the problem tree, re-examine the cause-effect links, and test the validity of the problem statements before returning to the objectives tree analysis.
- When reviewing the objectives tree, check if the means will have any negative effects, e.g., a new hydropower dam will result in a large number of people being resettled. Consider other options to achieve the core objective.

Visioning

A vision is an agreed long-term projection of what the water resources situation will ideally be in some future time. The vision provides the overall goal that the IWRM action plan strategy will aim to achieve. More specifically, visioning is important for:

- Building consensus with stakeholders on the future of local water resources;
- Giving the IWRM process direction; and
- Creating ownership among the public for the IWRM process.

When developing a vision the Lead Agency and the FCC should:

- Ensure that identified stakeholders are part of the visioning process;
- Coordinate the organisation of workshops in which the vision can be discussed and agreed upon with the relevant stakeholders; and
- Hire an independent facilitator to help ensure that the workshops are conducted professionally, that all participants have an equal chance to contribute and that the final outcome—the actual vision—is a consensus balancing the different needs and interests of all stakeholders.

Objectives of developing a vision:

- To develop a precise and shared description of how a group of stakeholders would like the water resources and water services, in their interest, to be in the future.
- For a group of stakeholders to reach consensus on a vision.
- To produce a vision that can provide a common focus and target for strategies and plans aimed at managing and improving the water sector.

Visions should be rooted in an understanding of trends in water supply and demand and of how potential risks and constraints might make it difficult to achieve a vision.

Visions created for interventions at the micro and meso levels should inform and be informed by national-level visions, policies and strategies for IWRM. It is vital that there are consistencies across visions created at different spatial levels and scales. A vision developed at the national level will be different from a vision developed for an intervention at the community level, but there needs to be mutual compatibility and consistency between these visions so that there are no conflicts in the IWRM process and strategy.

Steps in Developing A Vision

The six general steps for developing a vision are:

Step 1: Reach agreement on the entry point and the timeframe for which the visioning is to take place. Ensure that all stakeholders are involved and adequately represented in the process.

Step 2: Identify the main issues that are to be included in the vision. The information generated during the Problem Tree Analysis will help identify the issues. Specialist knowledge or other existing visions on the water sector can be helpful.

Step 3: Develop an outline vision for the geographic area over the agreed time frame. The vision is best described using a combination of numerical and descriptive narrative targets. The Vision should be SMART (specific, measurable, achievable, realistic and time-bound).

Step 4: Check the draft vision for consistency with other visions for IWRM in the country. The draft vision should also be consistent with development goals and policies of the government. Checking for consistency is important for winning political and financial support.

The process of developing a provisional vision is undertaken by a small group of stakeholders. The draft vision must therefore be circulated widely for comment before being finalised.

Step 5: Revise the vision if no appropriate strategies can be developed in the next step of the Planning Cycle.

Step 6: Disseminate the draft vision to all stakeholders and to the general public if appropriate. Comments and feedback should be encouraged. The vision should be finalized with the inclusion of constructive comments. The final vision should be circulated to all stakeholders and to the general public.

Scenario Building

Scenario building is a methodology that addresses uncertainties. It allows us to identify alternative strategies to deal with different possible scenarios that might unfold in the future. It is thus a methodology for an adaptive management of water resources. Scenario building improves strategy development by making stakeholders more aware of uncertainties, risks and constraints. This results in the formulation of a strategy that takes better account of and mitigates uncertainty and risk.

Scenario building is used to:

- Understand how external factors may affect water resources management in the future; and
- Provide a basis for the identification of alternative strategies suitable for dealing with these factors, and ensure that the actions will indeed be appropriate for working towards the initially agreed vision.

Scenario building is best done in one or more workshops with the relevant stakeholders, after the vision has been developed. Once the different scenarios have been worked out, alternative strategies can be developed that allow flexible adaptation to changing circumstances. Ideally scenario building should follow the visioning workshop and should involve the same stakeholders. The time required for these workshops will typically be two days.

The outputs of scenario development are:

- a detailed vision that has the support of all the stakeholders;
- a set of narrative scenarios based on the most important and most uncertain factors;
- a strategy or strategies for achieving the vision.

Steps in Scenario Building

The seven main steps are as follows:

Step 1. Identification of Vision or Objective. The first step of any scenario building process is to identify the specific decision (vision or objective that has been identified through the Problem Tree and Objective Tree Analyses) that has to be made. Typical examples in IWRM for SIDS are:

- Increasing water quantity during the drought season for communities in a water catchment.
- Protection and Management of Shallow Groundwater Resources in Locality 'Y'.
- Rehabilitation, Management and Monitoring of River System 'X' for Economic, Social and Environmental Benefits.
- Minimal Pollution of Coastal Waters and Marine Resources.

It is often at this stage that the time horizon for the scenario is determined. Information regarding the Lead Agency's perceived strengths and weaknesses to undertake the preparation and implementation of the strategy should also be collected and analysed.

Some Questions to Ask in a Scenario-Building Workshop

Critical issues. Would you identify what you see as the critical issues for the future? Suppose I had full foreknowledge of the outcome as a clairvoyant, what else would you wish to know?

A favourable outcome. If things went well, being optimistic but realistic, talk about what you would see as a desirable outcome.

An unfavourable outcome. As the converse, if things went wrong, what factors would you worry about?

Where culture will need to change. Looking at internal systems, how might these need to be changed to help bring about the desired outcome?

Lessons from past successes and failures. Looking back, what would you identify as the significant events that have produced the current situation?

Decisions that have to be faced. Looking forward, what would you see as the priority actions that should be carried out soon?

If you were responsible. If all constraints were removed and you could direct what is done, what more would you wish to include?

Source: Ringland (2002)

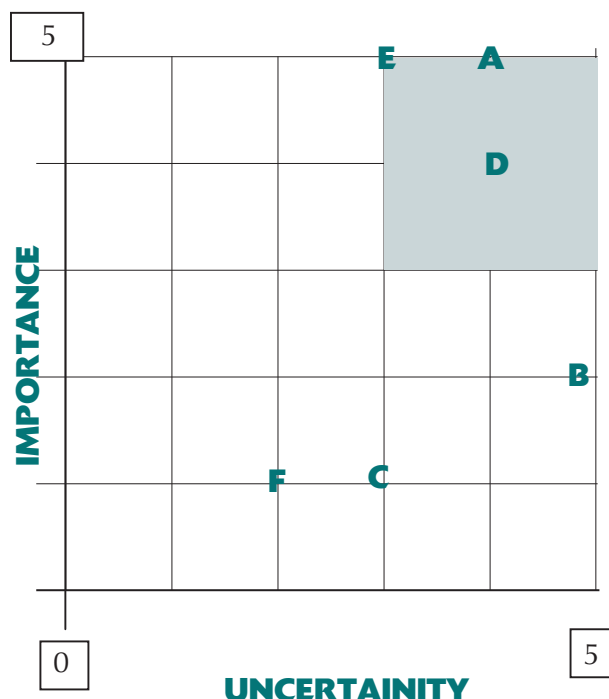
Step 2. Compiling factors that affect the future vision of water management and use. In the first step, stakeholders brainstorm on the various factors that are likely to influence the achievement of the vision. They then group the factors into two categories: **Local factors**, which the stakeholders can make changes to and influence themselves, and **external factors**, which tend to be beyond the control of the Lead Agency and the FCC. It is important that the facilitator encourages the stakeholders to think about both factors equally, and assess the social, technical, economic, environmental and political viability of these factors.

Step 3. Defining which of the factors are the most uncertain and the most important. Each of the **External** factors is classified according to uncertainty and importance and then ranked on a scale of 1 to 5 with 5 being the highest. The ranked factors are then placed in a grid. Those two to three factors placed furthest to the top right of the grid (the most important and most uncertain) should be used to differentiate between possible future scenarios (See Table 3.5).

The number of factors that are finally chosen for ranking should not be more than 20, and ideally less than 10. The factors that are in the top right hand grid, on the other hand must be more than 2 and less than 5.

Table 3.5 Ranking and classification of factors – an example

Factors	Most Important	Most Uncertain
A	5	4
B	2	5
C	1	3
D	4	4
E	5	3
F	1	2



Ranking and Placing of Factors in a Scenario Grid

Step 4: Identifying future states of external factors to allow these to be turned into consistent narrative stories. Using the less important and/or less uncertain factors placed elsewhere in the grid, a ‘background story’ is developed that is shared by all scenarios. The created scenarios should then be discussed amongst the stakeholders and labeled with high or low probability.

Step 5. Developing the scenarios. For each factor in the upper right of the grid, develop two opposite scenarios. If one of the factors is funding, one scenario will speak to the availability of funds while the other scenario will speak to the lack of funds.

Step 6. Drafting the overall background story and adding other quantitative information. Based on the workshop output, write a common ‘background story’ and list the key factors for as many different scenarios as are useful. Other factual information and data can be added at this stage to strengthen the scenarios. Modeling can also be carried out to examine the internal consistency of the scenarios. The final scenarios should be discussed with key stakeholders and refined as necessary.

For any given scenario there will be different strategies for attaining the vision. The main challenge in developing water resource strategies is to take into account all the uncertainties related to each decision. In recent times scenario building has become an important tool for water resources planning and management because it covers all possible outcomes, including worst-case scenarios. It therefore explicitly addresses the impacts of uncertainties. This contrasts with the traditional approaches based on “best guessed” projections.

The scenarios need to be fleshed out with a storyline that describes how the scenario state evolved from the present. Answer the questions:

- How would we get from here to there?
- What events would need to happen for this scenario to come true?
- What sort of people would characterise the scenario?

Each of the scenarios should be given a name that is **concise, vivid and memorable**.

It is important to focus on probability rather than on desirability.
The aim is to produce realistic scenarios.

Step 7. Develop Strategies based on each scenario. Using information generated during the situation analysis and any other information that may be available, develop “broad-brush” or elements of a strategy for each scenario. The purpose of this exercise is to identify which of the strategies will best achieve the vision. In some instances none of the strategies can achieve the vision, in which case the vision statement may have to be adapted. Where the technical skills and information is readily available modeling and cost–benefit analysis can be used to undertake a more formal assessment of the likely impacts of the various strategies on the vision (Example in Box 38).

One output of this step will be a summary table listing the main potential strategic elements that could be applied under each scenario.

Scenario	Strategy
1	1
	2
	3
2	1
	2
	1
3	2
	3
	4
4	1

Evaluate which strategies have the greatest potential to achieve the vision. A single strategy is then devised from the list of possible strategies. This selection has to be based on a set of criteria that is determined by the stakeholders.

Different strategies will benefit different stakeholders and some kind of conflict resolution may be needed as the final strategy is selected. The strategy that is finally selected must have political support and must have some element of funding available to start the implementation.

Once the best strategy is chosen, then more detailed development of the chosen strategy can take place. The aim is to identify a set of actions which, when taken together, will allow the vision to be achieved in full.

It is essential that a summary report coming out of the scenario building workshop is prepared and circulated to all stakeholders for their review and comment. The information must be provided in a format that is easily understood. When presenting the scenarios, it is essential to carefully consider the audience. Scenarios that only describe broad generalities, lacking supporting analysis and quantification, are not useful to policymakers, though they may be appreciated by the general public. In contrast, scenarios presented with a lot of technical detail and with great formality may prove too difficult for non-technical audiences to assimilate.

Scenario-building helps stakeholders come to grips with the uncertainty inherent in planning for improved water resources management. Scenarios represent a range of possible future circumstances against which strategies and plans to achieve the vision must be assessed.

Box 38. Ranking Tool

- Develop an unambiguous list of issues that need ranking.
- Develop a list of selection criteria by which to rank the issues. The criteria can be based on cost, likely impact, availability of funds, etc.
- Draw up a matrix with the issues on the horizontal axis and the selection criteria on the vertical axis.
- The group as a whole, scores each issue against the selection criteria. The scoring system can be 1 to 5 with 5 being the highest.

Selection Criterion	Issues				
	a	b	c	d	e
A	4	2	5	3	1
B					
C					
D					

Alternatively, each criterion is given a weighting and a rating (based on percentage points). The score for each issue is the weighting multiplied by the rating. The table will look as follows:

#	Criterion	Weighting (w)	Rating (r)	Score (w x r)
1		3	4	12
2		2	3	6
3		2	2	4

Weighting: 1–4. Rating: 1 (<5%); 2 (5–20%); 3 (20–35%); 4 (35–50%); 5 (> 50%)

Preparation of a Strategy

Strategy formulation is about charting a strategic direction identifying broad groups of actions and identifying how the challenges to achieving the vision will be mitigated. The detailed planning of activities does not take place in this phase.

The objective is to develop a set of broad strategies that will allow the vision to be achieved under different scenarios, and then to select the best strategy for further development. Strategising is a complex process that requires good facilitation. Workshop participants must be helped in working through the logic of their suggestion and in reformulating them if necessary. If advanced tools such as cost-benefit analyses and modeling are used, they should be completed before the workshop and the results presented, in appropriate format, at the workshop.

The broad and long-term nature of a strategy will necessitate many activities. These will have to be prioritised and implemented over an extended period of time. Often, only limited financing is available and additional funding has to be raised. So prioritising of activities becomes important.

The specific objectives of preparing a strategy are:

- To agree on the prioritisation and scheduling of activities that constitute the strategy, which taken together, will achieve the vision;
- To develop the implementation for different sets of activities and source funding; and
- To ensure stakeholder ownership of the strategy while implementing different activities.

Inappropriate strategies can result from:

- Lack of creativity in identifying scenarios and strategies;
- Failure to identify a single strategy to achieve the vision;
- Some of the more vociferous stakeholders controlling the process and identifying strategies that do not cover a wide spectrum of the stakeholders.

Up to the stage of preparing the strategy, the SIDS IWRM Planning process included all the stakeholders in a series of workshops. Planning, however, requires specialised skills, such as resource mobilization, project implementation and management, and from this point on only a sub-category of the stakeholders will be involved. A key challenge is therefore to keep all stakeholders engaged through good communications while creating good plans and mobilising the resources to implement them.

A consultation with all the stakeholders is recommended before the Strategy is finalized. The consultation should also include representatives of management from the Lead Agency and agencies represented in the FCC. Where appropriate, community representatives should also be consulted. Discussions during the consultation should also focus on whether the strategy can be improved by further mitigating the risks, reducing costs, refining outcomes, and internalising the externalities. It will also be useful to refer to lessons learned from other similar projects and programmes.

Preparation of an Action Plan

An Action Plan is a coherent set of decisions relating to the use of resources that, taken together, leads to the achievement of the objectives. A plan includes:

- An explicit statement of the methods to be used;
- Schedule of activities;
- Budget; and
- Targets to be monitored during the course of implementing the Plan.

The Plan must also identify capacity building and training needs. These activities must be scheduled and costed so that the Plan is sustainable. The actions identified for inclusion in the plan should be carefully considered, not only to ensure that they are indeed appropriate for achieving the strategic targets and objectives, but also to determine whether implementation is feasible within a realistic timeframe and with the financial resources available. Potential obstacles and risks to the implementation of an action should also be assessed when deciding whether or not it is worth pursuing.

The first step in the planning process is to convert the agreed strategy into a prioritised and phased set of activities which, when implemented, will achieve the vision. It is therefore necessary to ensure that all stakeholders understand and agree to the strategy.

The Plan must have detailed costing for each of the activities identified in the strategy. It must also identify the roles and responsibilities of the various stakeholders who will implement the Plan. There must also be agreement on the organisational and institutional structures necessary for implementing the Plan. Most importantly, the Plan must be approved by the FCC, the management of the Lead Agency, and the management of the various agencies represented in the FCC.

The Plan is best developed by a facilitator working in close collaboration with the Lead Agency and some representatives from the FCC. This group should be small enough to work efficiently but at the same time be representative of the stakeholders. If funding is available, it will be useful to hire an independent contractor to develop the Plan, working in close collaboration with the small team. The completed Plan must, however, be reviewed and signed off by all the stakeholders. Table 3.6 summarizes key activities in the preparation of an Action Plan.

Capacity Development

Capacity development should be a long-term continuous process to strengthen the performance of relevant agencies involved in implementing the Strategy and Action Plan. Capacity development, especially in SIDS, includes recognising the existence of skills which are being under-utilised.

Capacity development is much more than training. It includes:

- Equipping individuals with the understanding, skills and access to information necessary for them to perform effectively.
- A re-calibration of management structures, procedures and systems not only within a single agency, but also within agencies involved in the FCC and in implementing the strategy.
- Creating the necessary policy, legal and institutional environment so that the stakeholder agencies can collaborate and work together.

Table 3.6 Key tasks in the preparation of an Action Plan

Key Tasks	Description
Collection and selection of Project ideas	Workshops can be held to collect ideas on how the targets will be achieved. Criteria for suitable ACTIVITIES should be agreed and a number of suggested activities selected. These should be checked against the IWRM principles and other IWRM strategies, plans and policies that are available in the country.
Budget planning	Realistic long-term planning of finances is key to the implementation of an action plan. A professional and transparent approach to budget planning will help persuade investors, development banks and national or international donors to make financial resources available.
Establishing partnerships and the pooling of local resources	Budget constraints can be overcome through partnerships. Potential partners can be, for example, businesses, universities and NGOs. They can be encouraged to contribute their capacities by creating win-win situations.
Development of the Action Plan	Members of the steering group should meet and bring together the vision, strategy and pre-selected projects, which are used to create a draft action plan. Some actions should be identified for earlier or later implementation, depending on priorities. When complete, this draft action plan should be distributed to stakeholders for final comments; once feedback has been received, the action plan can be finalised.
Media and public relations work	As with the vision and strategy, the community must be made aware that an action plan has been produced. This is of particular importance, as the action plan will include targets that are likely to have an impact on the lives of the local population. A communication strategy can be used to raise awareness of the positive benefits for the community, as well as explaining that there are necessary trade-offs; e.g. the introduction of water pricing, which will not please everybody. This will help to further strengthen local ownership of the plan and encourage public participation in the implementation of activities. To raise the profile of the final plan, a launch event involving local media should be arranged to ensure a dynamic kick-off. Publishing the document professionally and in simple language encourages citizens to take an interest. Distribution should also be widespread so as to reach as large an audience as possible.

Implementation

Implementation is the phase where visions and plans become a reality. The aim is to achieve the stated objectives in the Strategy and Plans with a focus on efficiency, quality and cost-effectiveness.

Implementation always brings a new set of challenges for the implementing agency. These challenges include project management, transparency and financial management, to mention but a few.

A number of actions have to be put in place before implementation can begin. All activities must be scheduled so that the outputs can be achieved in a timely manner. The scheduling will also help to identify bottlenecks. The implementing agency must develop a Monitoring and Evaluation Framework which should include the targets to be monitored, the reporting period, institutional arrangements for circulating the report, etc.

There are no workshop-type activities for implementation, except for capacity development and awareness-raising.

A small representative team from the FCC should be identified to provide policy and technical guidance to the implementing agency during the implementation phase. This group should be small enough to undertake effective and efficient decision-making, but large enough that it is representative of the stakeholders. Activities that should involve the larger group of stakeholders include capacity building, training, and monitoring and evaluation.

The stakeholders, and where appropriate, the general public, should be informed about successes, but also be made aware of things that don't work as expected. A transparent approach to the presentation of results will increase the credibility of the Implementing Agency and of the strategy as a whole.

Expectations among stakeholders and the general public are likely to be high following the participatory approach to the development of the preceding stages of the planning process. It is therefore important that actions are visible and demonstrate tangible results early on, to build confidence in the process.

Key Points to remember

- Failure to gain political support can be due to many reasons, such as unrealistic budget planning, disregard of agreements with stakeholders, or lack of involvement of local politicians during the process. The momentum of the action plan process can be severely damaged, if not completely curtailed, by lack of political buy-in, resulting in disappointment and loss of motivation.
- The publication of the action plan will raise expectations of real improvements. This means all projects must be properly assessed before they are announced. Proposing unfeasible projects with no clear financing will seriously damage the credibility of the action plan as a whole.

Monitoring and Evaluation

Monitoring and Evaluation is the process through which implementation is monitored regularly and evaluated periodically to ensure that the outcomes are delivered on time and according to scope and budget.

Monitoring and Evaluation is a crucial step in the SIDS IWRM Planning Cycle. It is essential to monitor and assess the impact when activities are being implemented: Are the desired outputs, outcomes and impacts being achieved? Can the approach be replicated elsewhere? Do remedial actions need to be taken or the activity stopped completely?

The identification of the right indicators is central to the monitoring process and framework; this is probably the single most important and the most difficult aspect of monitoring. Monitoring may be formal or informal; and quantitative or qualitative. The indicators have to be sufficiently robust to allow impacts to be identified and analysed. Good indicators are unambiguous, simple to collect and cost-effective to monitor. See Table 3.7.

A clear set of mechanisms is also needed to identify, collect, record and communicate information: Who should collect the information; how often should the information be collected; what should they do with the information; who should the information be presented to; how should it be packaged; and how will the results be discussed and acted upon.

Key Points to remember about Monitoring and Evaluation (M&E)

- M&E programmes should be well budgeted for.
- M&E programmes need quality control procedures and data management systems.
- M&E programmes must be independent so that the data is not manipulated to show results which do not reflect reality.
- Indicators can be quantitative or qualitative. They must, however, be standardised so that they allow for comparison over time and space.
- Tools and methods include technical tools and methods for the measurement of a variety of data, but also refer to interviews, photographic documentation of situations 'before and after', public hearings, etc.
- The methodologies have to match the indicators as well as the stakeholders. If M&E is solely based on a technical, highly specialised approach, certain groups of stakeholders who are very important as a source of feedback on project progress – or lack thereof – may be excluded from taking part in the process.

Table 3.7 Minimum Indicator Set for SIDS IWRM Approach

Function	Type of Indicator	Definition
Entry point	Process Indicator	<ul style="list-style-type: none"> Was a Diagnostic (Hot Spot, Sensitive Analyses) undertaken? What national development documents were referred to? Does the entry point have national significance? Will the Entry- Point allow for scaling up and scaling out?
	1. How was entry point Chosen	
Choice of Lead Agency	Process Indicator	<ul style="list-style-type: none"> Does Agency have a water mandate? Does it have adequate TORs to perform functions of Lead Agency? Does Agency have the necessary resources – financial and human? If the entry point is at the meso or micro levels, are the communities familiar with the Lead Agency? Does the Lead Agency have skills for community mobilisation?
	1. How was Lead Agency chosen	
Establishment of the Facilitating and Coordinating Committee (FCC)	Process Indicator	<ul style="list-style-type: none"> Was a Stakeholder Analysis conducted using grid provided in SIDS IWRM Approach? <ul style="list-style-type: none"> Types of agencies represented in the FCC Is it gender-balanced? Is the FCC an existing mechanism or was a new mechanism created? Does the FCC have Terms of Reference
	1.Composition of the FCC	
	2. Functioning of the FCC	<ul style="list-style-type: none"> Does the FCC have a mandate, e.g. Cabinet Decision? Is there a MoU or some other formalised agreement between the member agencies of the FCC Do Members of FCC at national level have delegated representatives Number of meetings held Percentage attendance at each meeting
Situation Analysis	Process Indicator	<ul style="list-style-type: none"> Methodologies employed Who participated Was an ecosystems approach used to determine relationship between various ecosystems Does data reflect relationship between uses and users of water throughout entire hydrological system, including coastal and near shore resources Was consideration given to impact of climate variability and change and impact of hazardous events? Was the Gender Analysis Framework used? Was there a legal, policy and institutional analysis?
	1.Sufficiency of Situation Analysis methodology and data sets	

Function	Type of Indicator	Definition
Problem Tree Analysis	Progress Indicator	<ul style="list-style-type: none"> • What methods were used? Hot spot analysis; Problem tree Analysis? • Who participated in the analysis? • Did stakeholders sign off on analysis and choice of root problem, hot spot?
	1. How was the root problem, hot spot identified	
Objective Tree Analysis	Impact/Outcome Indicators	<p>What methods were used? Who participated? Was there sign off by all stakeholders?</p>
	1. How were the goal(s) and objectives determined	
	2. What is the objective the activities are designed to achieve?	<p>Examples</p> <ul style="list-style-type: none"> • Improved water quality through improved land use and management • Restoration of wetland ecosystem • Water supply catchment protection • Sustainable management of watershed through land use management • Improve groundwater for drought relief
	3. Measure of whether goals and objectives were attained	<p>Examples of Units</p> <ul style="list-style-type: none"> • % of population benefiting from intervention • % increase in water service delivery • % of households with access to pipe borne water in house/yard • % of households with access to sanitation • Time taken to collect domestic water per household • % of wetland ecosystem restored • % increase in species in wetland ecosystem

Function	Type of Indicator	Definition
Plan Formulation	Stress Reduction And Environmental Indicators	Examples of Outputs <ul style="list-style-type: none"> • % of target groups supplied with sufficient quantities of clean water • % of existing water points in target area repaired • % households provided with latrines
	1. What will be the measurable results of the planned activities? 2. What activities will be undertaken to achieve the outputs?	
Plan Implementation	Examples of Activities	
		<ul style="list-style-type: none"> • % of water points brought into operation, water quality tested • % of existing water points in operational order • % of latrines built and used correctly

Documentation

Documenting the implementation of the SIDS IWRM Planning Cycle is a critically important activity. There are two types of documentation: documentation of the results of the implementation of the activities; and “process documentation”, which records and supports the Planning Cycle itself. Process documentation is about capturing the “how” of the implementation process, rather than only the “what” of the process’s impact. Process documentation will help to identify best practices and lessons learned for future similar endeavors and for sharing experiences across space.

Adequate financial and human resources must be set aside for documentation. Tools for documentation should also include audiovisual equipment and materials.

Tools for documentation can be divided into four groups:

- Tools for capturing the implementation of the activities and of the process. These will include one-on-one interviews, focused group discussions, photography, video, etc.
- Tools for organising and disseminating the information. All the information that is collected and documented should be stored for easy retrieval.
- Tools for analysis and reflection. Time, space and funds should be allocated for reflecting on the status of implementation. The Implementing Agency may circulate Annual Reports or make annual presentations to various stakeholder groups including the Steering Committee, the FCC and the Lead Agency for the Process.
- Tools for disseminating information should also include the channels for dissemination. This includes asking which channels should be created by the Implementing Agency and which channels should be outsourced? Are there outside channels that can be mobilised at minimal costs? Which channels can be influenced to form strategic partnerships? Some new channels (internet, websites) can be managed by staff of the Implementing Agency.

Communications

Communication does not just happen. It must be organized, developed, and built. The first step in the process is to define a communications strategy.

A good communications strategy allows you to exercise better control over your work and to frame the issues in a perspective other than research. A communications strategy removes doubt, emphasizes planning, and involves all the project participants in raising the visibility of the IWRM strategy.

Defining the communications strategy is a task that is best carried out as a group. In addition to pooling expertise, a group approach has the even more important advantage of building on interactions between the participants. It may be useful to hire a consultant to work with the group in defining the IWRM project’s Communications Strategy. See Boxes 39 and 40.

A communications strategy can be developed in several stages:

- A preliminary outline is prepared by the Implementing Agency and a few stakeholders who have communications skills.

- The outline is submitted to various other stakeholders and partners for comments and revisions. These partners can be consulted individually, in groups, or in a brainstorming session that includes anyone who can make a contribution.
- The team meets to finalize the strategy. The input of a communications expert is highly desirable at this stage.
- Once the strategy has been established, it must be communicated to the stakeholder's partners.

Developing a Communications Strategy

Regardless the objectives of a project, defining a communication strategy shows attention to planning, an understanding of the situation, an ability to carry out the work, and clear identification of the goal.

Box 39. The GEF IWCAM Communications and Education Planning Guide

The purpose of this Guide is to help Participating Countries (PCs) develop and implement communications and public education activities to help promote and strengthen integrated approaches to watershed and coastal area management at the community, national and regional levels. This strategy also aims to help the Project Coordinating Unit (PCU) find effective ways of ensuring that key lessons and best practices from the Project are effectively communicated to target audiences at every level.

Development of a communications strategy can help to:

- Establish a 'baseline' picture of existing "Knowledge levels, Attitudes, Practices and Behaviours" (KAPBs) that will in turn indicate where there are gaps in behaviours or attitudes that need to be addressed or targeted.
- Identify key actors and channels for communication, including traditional forms of communication.
- Clarify and reinforce project objectives, particularly in terms of strengthening environment and resource management at the national level.
- Link communications objectives to project objectives.
- Set achievable project objectives, given available resources.
- Develop useful tools and activities to raise awareness.
- Identify key indicators (including behaviour change indicators) and measure their performance.

Source: IWCAM PROJECT, 2008. GEF - IWCAM Project Communications and Education Planning Guide

Box 40. The International Waters Programme (IWP) Communications Strategy

The overall IWP Communications Strategy follows a 5-stage process:

Stage 1: Assess

- The current KAPBs and gaps that need to be addressed
- The problem, including how local communities perceive the problem, which can be ascertained through baseline Knowledge levels, Attitudes, Practices and Behaviours (KAPB) research or situational analysis
- The target audiences
- Communication channels and opportunities
- Resources available to implement communications activities

Stage 2: Plan

- Setting realistic, achievable and measurable objectives. Both SMART objectives and “necessary and sufficient” indicators.

Stage 3: Design

- Developing effective messages, communication interventions or activities that engage stakeholders in learning about the problem and in identifying solutions.

Stage 4: Pre-test

- Testing these messages and methods with their target audiences.

Stage 5: Evaluate

- Finding ways to continuously improve their communications programmes.

Source: Strengthening the Management of Waste, Freshwater and Coastal Fisheries in the Pacific Islands (2005)

The main components of a Communications Plan are:¹

- Communications Objectives – What and why are you communicating?
- Target Audience – Who do you want to communicate to?
- Communication Tools – What method of communication is most appropriate for your target audiences?
- Timing and frequency – How often and when to communicate?
- Responsibilities – Who is going to communicate?
- Communication quality – Key concepts for excellent communication.

Many different groups and individuals are potentially interested in water resources management and in the water sector in general. However, people are busy and there is an increasing overload of information from many different sources. For a message to break through the information overload, it has to be based on the needs of the target audiences. For this reason the messages that are communicated and the means of communications should be disaggregated by type of audience. For the communication to be effective audiences have to be selected and directly targeted with

¹ Government of South Australia, South Australian Murray Darling Basin Natural Resources Management Board. Guidelines for Preparing a Communications Plan.

the appropriate messages and means of distribution. It may be that different audiences may want different types of information or that the same information needs to be communicated differently to different audiences.

There is a range of tools for communicating information. These include:

- Project or data sheets
- Conference, forum or information sessions
- Scientific journal article
- Local or regional newspapers
- Field or demonstration days
- Project pamphlet or brochure
- Project newsletter
- Project meetings
- Project website
- Other websites
- Radio
- Television
- Government channels.

Press releases

Press releases are a well known means of conveying key information on policies, accomplishments, success stories, high-ranking visitors, important events, etc. to the general public. An agency that has decided to pay increased attention to water resources and establish a participatory planning process to improve existing management practices will need the media throughout the IWRM planning and implementation process. Chances to achieve the newly set objectives would be slim without widespread awareness among all sectors of society of the benefits that sustainable management of water resources can provide.

Press releases during an IWRM planning process

There are a number of typical elements in an IWRM planning process in which a press release might be a useful instrument to keep the public informed and interested in the process. Along with other tools of communication, press releases may be considered when:

- A situation analysis of the water resource has been undertaken;
- Workshops are being organised to bring stakeholders together to develop a water vision;
- The Government has endorsed the water vision;
- The Lead Agency and the FCC have finalised the strategy or issued the water plan;
- Success stories deriving from implementing the strategy and plan are emerging;
- Water reports summarising the results of monitoring activities are being published.

Gender Mainstreaming

Gender mainstreaming, developed and refined through trial and error in many projects in developing countries, has proven to be the most efficacious in harnessing the human resources of local and national communities for the delivery of safe, reliable supplies of water at a cost users are willing to pay. It has also been shown to be an effective instrument for achieving sustainable use of water resources for the present, and protecting and safeguarding these resources for future generations.

Gender plays an intricate role in IWRM—not just in the planning process, but also through the stakeholder consultations and all other steps. A sound gender approach would ensure that the complementarity of men’s and women’s roles and responsibilities is mobilized to best effect; that the creativity, energy and knowledge of both genders contribute to making different water schemes and freshwater ecosystem projects work better; and the benefits and costs of water use accrue equitably to all groups.

The main feature of the gender approach is that it focuses on men *and* women and not on women in isolation. Gender refers to the specific roles and responsibilities adopted by women and men in any society. It is related to how we are perceived and expected to think and act, as women and men, because of the way society is organized, not because of our biological differences.

The gender approach implies that attitudes, roles and responsibilities of men and women are taken into account, that it is recognized that both sexes do not necessarily have the same access to, or control over resources, and that work, benefits and impacts may be different for both groups. The gender approach requires an open mindedness and aims at the fullest possible participation of both women and men.

Ecosystems Approach

Table 3.8 summarises the Ecosystems Approach and its relation to IWRM Planning for SIDS.

Table 3.8. The Twelve Ecosystems Approach (EA) Principles and how they relate to the SIDS IWRM Approach

		EA Principles applicable	Ecosystem Approach Principles (http://www.cbd.int/ecosystem/principles.shtml) <ul style="list-style-type: none"> The following 12 principles are complementary and interlinked.
Phase 1: Diagnosing			<p>Principle 1: The objectives of management of land, water and living resources are a matter of societal choices.</p> <p>Principle 2: Management should be decentralized to the lowest appropriate level.</p> <p>Principle 3: Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.</p> <p>Principle 4: Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context.</p> <p>Principle 5: Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.</p> <p>Principle 6: Ecosystem must be managed within the limits of their functioning.</p> <p>Principle 7: The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.</p> <p>Principle 8: Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.</p> <p>Principle 9: Management must recognize the change is inevitable.</p> <p>Principle 10: The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.</p> <p>Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.</p> <p>Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines.</p>
• Identifying the Entry Point	7, 8		
• Stakeholder Analysis	1, 12		
• Situation Analysis	4, 6, 7, 10, 11		
Phase 2: Visioning			
• Problem Tree Analysis	4, 5, 6, 7, 8, 10		
Phase 3: Planning			
• Scenario Development	1 – 10		
Phase 4: Strategising			
• Action Plan and Budget • Responsibility Matrix • Scheduling • Monitoring targets and indicators	1 – 12		
Phase 5: Implementation			
	2, 7, 9, 12		
Phase 6: M&E and Documentation			
	11		

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For a simple step by step guide, see: <http://www.scu.edu.au/schools/gcm/ar/arp/stake.html>
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SECTION 4. Annexes

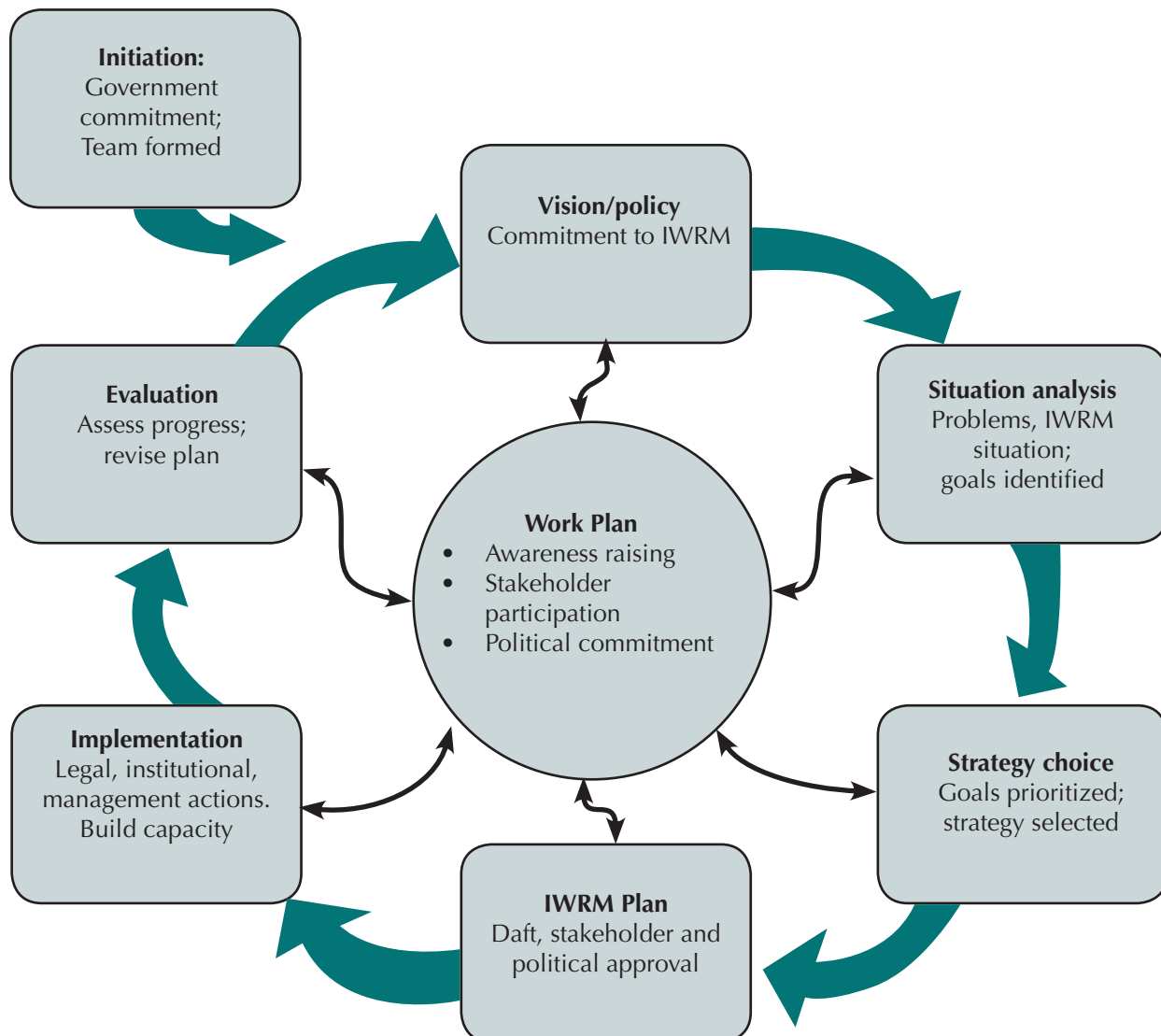
The Annexes are a collection of best practices of templates and guidelines that have been used in other IWRM initiatives. The majority of these best practices come from the Pacific and Caribbean Island Countries. At the moment there is no available literature on IWRM tools and methods used by the Atlantic and Indian Ocean SIDS. Indeed, it is only recently that these SIDS have embarked on IWRM Planning exercises.

The best practice tools for scenario development were chosen from the Middle East where EMPOWERS has extensively employed scenario development techniques for water governance at the governate and village levels.

Annex: 1. Types of Planning Cycles Used In IWRM

1. The GWP Planning Cycle

According to the GWP Guidelines, the trigger to start a planning process may be internal or external or a combination of both. IWRM planning requires a team to organise and coordinate effort and facilitate a regular stakeholder consultation. An important starting point for government commitment is an understanding of IWRM and water resource management principles for sustainable development. Central to the whole planning process is the management of the process; maintaining political commitment; ensuring effective stakeholder participation; and creating awareness of IWRM principles.



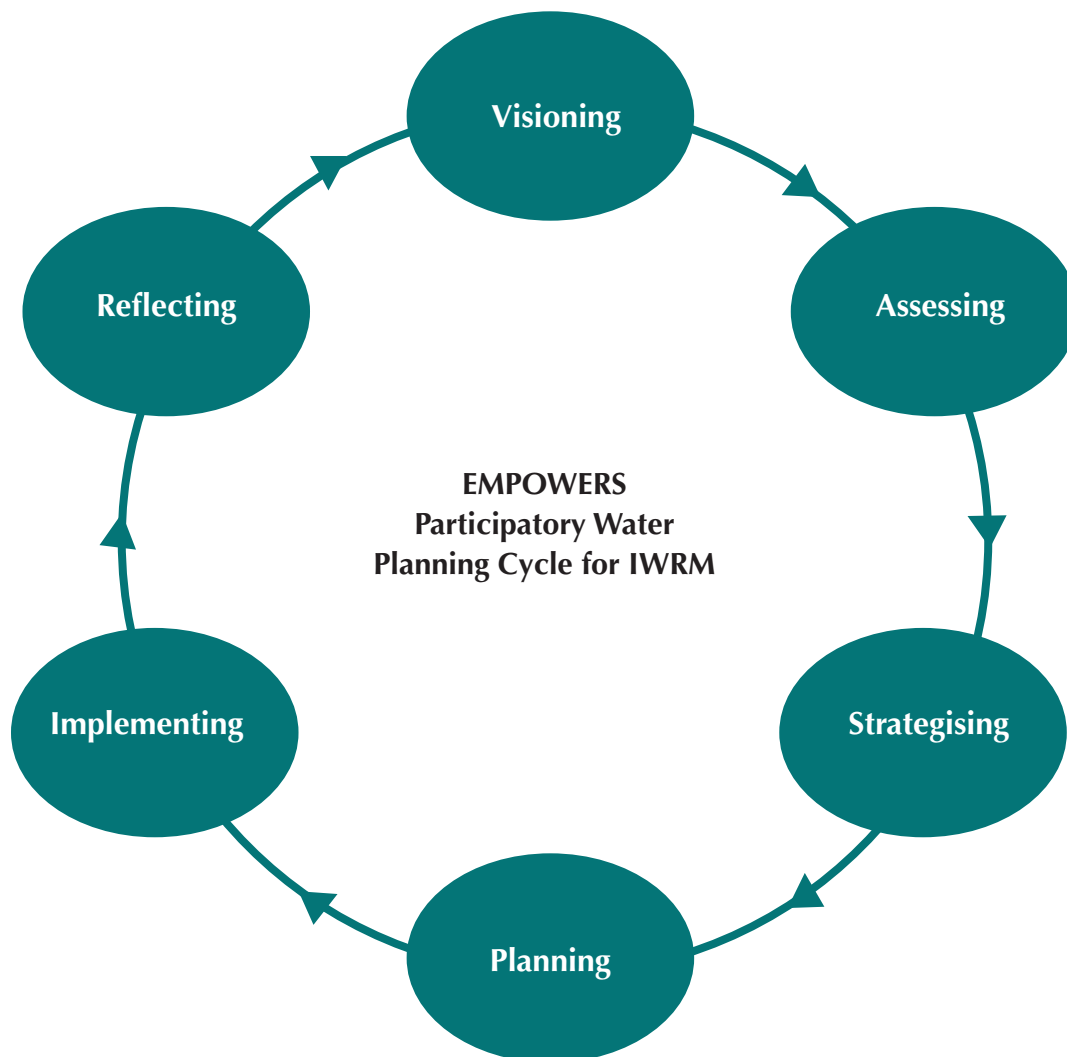
GWP Planning Cycle

Source: Cap-Net

2. The EMPOWERS Planning Cycle – See file: IWRM planning brochure

The EMPOWERS IWRM cycle, in common with most other project management cycles emphasizes the need to put decision making regarding water-based actions within a clearly defined set of steps that ensure that the decisions reached are based on a clear and logical flow of thought. However, where the EMPOWERS approach differs to many project cycles is in a) its assumption of the need (and provision) for stakeholder involvement at all phases; and b) in its explicit acknowledgment of uncertainty and future variability, which it addresses by incorporating scenario building into the steps of the cycle.

The EMPOWERS framework takes the form of a simple programme cycle, or more correctly a set of sub cycles nested within a larger cycle. The overall objective of the cycle is to allow stakeholders at all levels to develop and share visions, plans and strategies that are based (using scenarios) on a thorough understanding of current problems and trends. Each step of the cycle has an associated set of tools, drawn wherever possible from existing sources.



The EMPOWERS Planning Cycle
Source: EMPOWERS Working paper No.3

3. The Pacific Islands IWRM Planning Cycle

The IWRM Planning process developed by SOPAC on behalf of the PICS includes all the stages identified in the GWP Cycle, although the terminology is different.

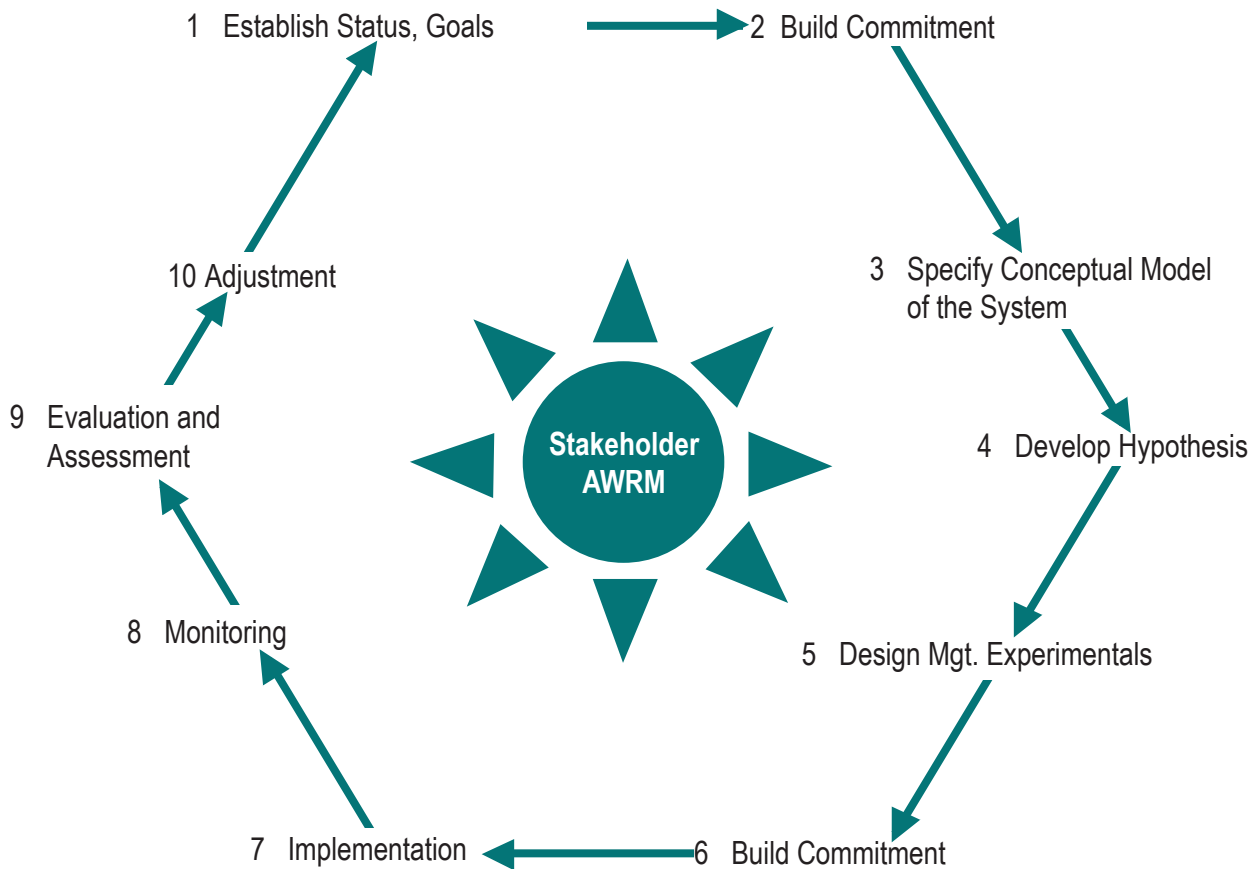


The SOPAC/PICS Planning Cycle

Source: Pacific IWRM Brochure

The process however allows for different stages to be undertaken in different order or simultaneously depending on the situation. It takes a participatory and gender balanced approach and strives to include stakeholders from all groups and ages.

4. The IWRM Adaptive Management Planning Cycle



The Learning Cycle for Adaptive IWRM

Source: *IWRM and Adaptive Management, NeWater Report series No. 7*

The learning cycle of Adaptive Management (AM) includes the following sequence of steps, which are continually repeated

- 1) establish a stakeholder adaptive management team;
- 2) define the problem(s) to be addressed;
- 3) establish goals and objectives;
- 4) specify a conceptual model that expresses the collective understanding of how the system in question functions; highlighting key uncertainties and acknowledging factors that are outside of the system;
- 5) develop hypotheses about the effects of different management actions that address the uncertainties;
- 6) design management experiments/interventions to test hypotheses while meeting management goals;
- 7) design a monitoring plan to measure the impact(s) of management interventions;
- 8) implement management interventions;
- 9) monitor;
- 10) evaluate the impacts in terms of management goals and hypotheses; and
- 11) reassess and adjust the problem statement, goals, conceptual model, interventions, and monitoring plan.

As a result of this cyclical learning process, the focus is on response and scenario building based on the monitoring of carefully defined indicators.

For all of the Cycles, except the EMPOWERS Cycle, the starting point of the IWRM process is the burning and urgent water resources issues as seen in the **National** context. In the case of EMPOWERS, the starting point is at the village or township level. In all instances, the Cycle charts the progress towards a management framework within which issues can be addressed and agreed on and overall goals achieved. Political will is a prerequisite and building a multi-stakeholder support comes high on the list of priority actions. The dialogue is based on knowledge about the subject matter and awareness-raising is one of the tools to establish this knowledge and participation of the wider group of stakeholders. Gaps in the IWRM framework are analysed in light of the management functions required to mitigate the urgent issues.

Annex 2. Sample Stakeholder Survey Assessment¹

The survey assessment of relevant stakeholders, their interests, potential contributions to the IWRM development process and relative degree of influence revealed the following results

Stakeholder	Interests	Priority influence	Category (1-4)	Capacities	Potential Roles in the IWRM Plan
MoA- Land Use Division	Develop plan	1	HH	Technical	Coordination of IWRM Plan development; lead support to an National IWRM Steering Committee (IWRM-SC)
MoA- Forestry Division	Watershed	1	HH	Technical	IWRM-SC core member; watershed protection
MoA- Extension Division	Irrigation	1	HL	Technical	Agricultural development; irrigation development
NAWASA	Quality and quantity	1	HH	Technical	IWRM-SC core member; water supply and sewerage services
MoH- Environmental Health Department	Quality and quantity	1	HH	Technical	Health sector development; safety and sanitation
MoH- Environment	Environment	2	HL	Technical	IWRM-SC core member; general environmental management
MoF- Physical Planning Unit	Developmental	1	HH	Technical	IWRM-SC core member; land development and water source protection
MoA- Veterinary	Supply	2	HL	Advisory	Animal husbandry; water supply
CAPE	Quantity and quality	1	HH	Technical	IWRM-SC core member; engineering standards related to infrastructure
Ministry of Tourism	Quantity and quality	1	HH	Technical	Tourism development; potable and recreational waters supply and maintenance
Grenada Hotel and Tourism	Quantity and quality	1	HH	Advisory	Same as above
Grenada Tourist Board	Quantity and quality	2	HH	Advisory	Same as above
Distiller Association	Quantity and quality	2	LH	Technical	Industrial water supply availability
Grenada Marina and Yachting	Quantity and quality	2	LL	Advisory	Recreational water quality and access (navigation)
Farmers Association	Irrigation	1	HH	Advisory	Irrigation water supply development
Grenada Bureau of Standards	Quality and quantity	2	LH	Advisory	Standards for potable and waste water
Grenada Industrial Development Co	Quality and quantity	2	HH	Advisory	Industrial and commercial development and water resources
Ministry of Social Affairs	Quality and quantity	1	HH	Advisory	Poverty reduction and social development; human health related to drinking water and sewerage services
Ministry of Works	Quantity	2	LH	Technical	Infrastructure projects and supply availability
Ministry of Education	Quality and quantity	1	HH	Advisory	Raising awareness (water conservation issues); HR capacity development for WR

¹ This assessment was undertaken by CEHI during the preparation of the IWRM Roadmap for Grenada

Annex 3. Stakeholder Screening Guidelines Used By The IWCAM Project

The following questions must be borne in mind when completing the Stakeholders' Matrix:

- Who are the main stakeholders that would need to be involved in development and implementation of an IWRM plan?
- What are the benefits of stakeholder involvement?
- What are the possible implications of not involving stakeholders?
- Which partners within government have the potential to become involved in the IWRM plan process?
- Who has a mandate that is directly related to issues that are likely to be addressed in the IWRM plan?

Are there partners for whom the relationship is not immediately obvious? For example, officials from a Ministry of Finance may have no direct mandate relating to water resources management, but may make decisions that have profound implications for the success of an IWRM plan such as budget allocation and taxes.

- Who might be affected by the IWRM plan?
- What are their interests and positions?
- Who has information and expertise that might be helpful?
- Who has been/is involved in similar initiatives or planning?
- Who has expressed interest in being involved in similar initiatives/efforts before?
- Who else might be interested in preparing the IWRM plan?
- Are there stakeholders who might want to be fully involved, but for some reason can't be involved to the extent that they would like to be? What are those reasons?

You should classify the stakeholders according to the four groups below (1 – 4) and enter this in the Matrix under Category

- Those who will likely want to participate fully or whose active involvement will determine the credibility of the process;
- Those that should serve on the coordinating committee
- Those that should be involved in the planning and development processes
- Those that should be involved in the implementation process
- Those that should be involved in the monitoring and evaluation processes
- Those who would likely play a more limited role;
- Those who would wish simply to be kept well informed;
- Those who would not want to be involved

For each stakeholder, enter one of the following rating under Priority/Influence:

- HH – High Priority/High Influence
- HL – High Priority/Low Influence
- LH – Low Priority/High Influence
- LL – Low Priority/Low Influence

Annex 4. Sample List of Stakeholders from the Pacific

	Governmental	Civil society and NGOs	Private
Sub-national	<ul style="list-style-type: none"> • Provincial/area/district departments • Municipal authorities • Public utilities • Universities and colleges 	Community based organisations <ul style="list-style-type: none"> • Schools • Local sections of NGOS • Youth associations • Women’s groups • Churches • Village development committees • Rural training centers 	Local business <ul style="list-style-type: none"> • Clans and families • Individuals
National	<ul style="list-style-type: none"> • National government departments/Public works departments • Universities and research institutes • Media (governmental) 	<ul style="list-style-type: none"> • National NGOs and NGO coalitions • Branches of international NGOs • Faith-based organisations • Universities • Teachers associations and trade unions 	<ul style="list-style-type: none"> • Private sector business (Engineering) • Business associations • Media (private)
Regional	<ul style="list-style-type: none"> • Regional inter-governmental groupings(SOPAC/SPPEP) • Regional MPM networks 	<ul style="list-style-type: none"> • Regional NGO groupings and networks • Faith-based organisations 	<ul style="list-style-type: none"> • Regional business associations
International	<ul style="list-style-type: none"> • UN agencies, ADB and World Bank • Global Water Partnership • Dialogue of Water and Climate • UNDG member agencies • Millennium Project Task Forces • Official/semi-official watchdog bodies 	<ul style="list-style-type: none"> • WRM networks • NGO UN Liaison Committee • International environmental NGOs and water alliances • Faith-based organisations 	<ul style="list-style-type: none"> • International associations of business (e.g. in the extractive sector) • Media corporations

Annex 5. Table of Contents for National Integrated Water Resource Management Diagnostic Report, Cook Islands

WATER RESOURCES MANAGEMENT

Types of freshwater resources

Types of freshwater uses

Majors Issues and Concerns

Measures to manage impacts and concerns (IWRM approaches)

Island Vulnerability

Types of disasters with major issues and concerns

Measures to manage impacts and concerns (IWRM approaches)

Awareness

Type of awareness campaigns, advocacy initiatives currently being undertaken

Major Issues and Concerns

Measures to manage impacts and concerns (IWRM approaches)

Technology

Types of water supply systems

Types of wastewater/sanitation systems

Majors Issues and Concerns

Measures to manage impacts and concerns (IWRM approaches)

Institutional Arrangements

Types of Institutional Arrangements

Majors Issues and Concerns

Measures to manage impacts and concerns (IWRM approaches)

Financing

Types of Financing Arrangements

Majors Issues and Concerns

Measures to manage impacts and concerns (IWRM approaches)

LINKAGES TO OTHER AREAS

Land use and Agriculture

Irrigation and rain-fed agriculture

Agriculture and water quality

Land ownership and land use policy

Deforestation and sedimentation

Summary of land use and water management issues

Habitats and Ecosystems

Health and Hygiene

Watershed and coastal management

Stakeholder Engagement

OTHER PROGRAMMES, PROJECTS AND ACTIVITIES RELATED TO IWRM

CAPACITY DEVELOPMENT NEEDS FOR REMOVING THE BARRIERS

INTRODUCING AN INTERGRATED APPROACH TOWARDS BARRIER REMOVAL

Annex 6. Sample Table of Contents for Situation Analysis of the Water Sector and Resources Provided by the Iwcam Project

Section A

- 1 Key Terms in Integrated Water Resources Management
- 2 Guidelines for Completing the Information Template

Section B

1 Processes and Milestones leading towards IWRM

- a. National Water Resources Management Vision
- b. Awareness on IWRM
- c. IWRM Plan
- d. National Programmes and Projects
- e. Other National Plans that are likely to contribute to IWRM
- f. Context for IWRM Planning
- g. Challenges and Constraints to IWRM

2 Water Policy

- a. Policy Environment
- b. Policy Coverage
- c. Other Policies Impacting on IWRM

3 National Water Legislation

- a. Water Legislation
- b. Coverage of Existing or Proposed Water Laws
- c. Regulations Supporting the Existing Water Laws
- d. Other Legislation Impacting on IWRM

4 Institutional Framework for the Water Sector

- a. Regional and International Environment
- b. National status of Regional & International Agreements, Conventions, Obligations and Initiatives for IWRM
- c. Institutional and Administrative Framework
- d. Inter-sectoral Coordination
- e. Capacity for IWRM
- f. Regional and International Environment Technical Assistance
- g. IWRM Training
- h. Stakeholder Analysis

5 Resource Analysis

- a. Water Resources
- b. Water Ownership
- c. Watershed/Catchment

Annex 7. Scope of Water Resource Situation Analysis

Annex 7. Scope of Water Resource Situation Analysis

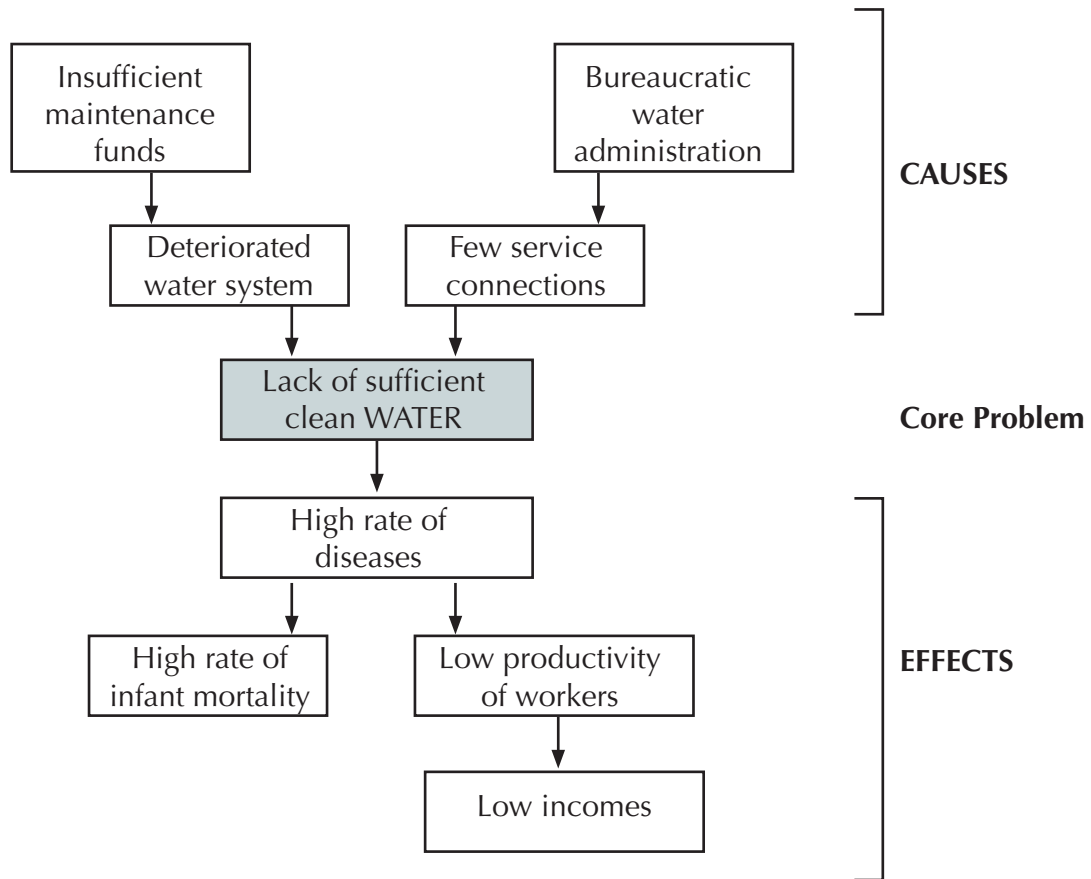
- **Institutional and legal analysis.** Access the mandates of institutions, laws and policies for conflict, conformity, overlap and consistency with sustainable management of water resources.
- **Hydrological and hydrogeological assessment** examines the extent of the surface and groundwater resources available, taking account of seasonality and long term trends in supply
- **Demand assessment** examines the competing uses of water with the physical resource base and access demand for water (at various prices), thus helping also to determine the financial resources available from tariff revenues for water resource management in different development scenarios.
- **Environmental impact assessment (EIA)** collect data on the social and environmental implications of development programmes and projects. EIA is an important tool for cross-sectional integrations involving project developers, water managers, decision-making and the public. It can be seen as a special form of water resources assessment
- **Social assessment** examines how social and institutional structures affect water use and management, degree of equitable access to water as by gender and how specific projects might affect the social structure
- **Risk or vulnerability assessment** analyses the likelihood of extreme events, such as flood assessment; the environmental implications of development in programs and projects; management, or how a specific project might affect social structures; and droughts, and the vulnerability of society to them.
- **Demand management assessment** assesses the potential for water reclamation, re-use, recycling and desalination.

Adapted from the GWP IWRM Toolbox

Annex 8. Sample of Capacity Assessment Undertaken in Grenada

Capacity for water resources management (Rotating: 0=no capacity; 1=little capacity, needs to be built; 2= some gaps but is workable; 3= capacity fully exists)	Public Sector				Private Sector			
	0	1	2	3	0	1	2	3
Policy formulation			■				■	
Drafting of laws & regulation		■				■		
Preparation of WR assessments		■					■	
Preparation of EAs			■				■	
Preparation of socio-economic assessments			■				■	
Monitoring of water quality			■			■		
Monitoring of water availability			■				■	
Monitoring of aquatic ecosystems			■			■		
Monitoring of pollution loads			■			■		
Monitoring of water use		■				■		
Resource use planning, protection, and conservation			■				■	
Water demand management		■				■		
Water allocation		■				■		
Conflict meditation		■				■		
Information generation, collection, analysis			■				■	
Laboratories for testing			■			■		
Measuring impacts			■				■	
International negotiations		■				■		

Annex 9. Sample Problem Tree²



² The World Bank Group, 1991-2001. Upgrading Urban Communities. A Resource Framework

Annex 10. Assessing the Potential for Possible Elements of a Strategy, Using Different Scenarios: An Example from Balqa Governate, Jordan³

Main elements of strategy	Scenario			
	1	2	3	4
• Increase dam capacity or construct new dams to store rainfall water and recharge	+		+	
• Decrease the overuse of water from ground water	+	+	+	+
• Upgrading of field applications techniques (changing from surface to drip irrigation)	+	+	+	+
• Improve the domestic water network (decrease the water losses)	+	+	+	+
• Increase the water storage capacity by constructing water reservoirs in Balqa governate to provide inhabitants with water directly from the reservoir	+	+		
• Conduct research on making use of the unconventional water resources	+		+	
• Extensive and improved operation of existing wastewater treatment plants (6 MCM/a total capacity) to make their effluents safe of use for irrigation	+		+	

Note

Important and certain factors common to all scenairios: old water network; lack of water use awareness; low storage capacity, high population growth rate; lack of coordinaion/cooperation among the S/H; weak application of water policy legislation inappropriate crops; increased demand for touristic and industrial sectors; illegal water use; confidence in drinking water quality.

Scenario 1: High average rainfall; local government has good access to funds

Scenario 2: High average rainfall; local government has poor access to funds

Scenario 3: Reduced average rainfall; local government has good access to funds

Scenario 4: High average rainfall; local government has poor access to funds

³ Moriarty, Patrick, Charles Batchelor, Firas T Abd Alhadi, Peter Laban, and Hazem Fahmi, 2007. The EMPOWERS Approach to Water Governance: Guidelines, methods and Tools. INWRDAM, Chapter 5.

Annex: 11. Example of Scenarios Developed for Meithaloun Village, Palestine⁴

Meithaloun is situated 20 km south of Jenin City with a population of slightly over 6,500. It is the centre of the southern villages in Jenin Governorate. From its northern side, Meithaloun is bounded by the famous plain of ‘Marj Sanour’, which is one of the most important agricultural areas in the Governorate. More than two thirds of Marj Sanour area is owned by Meithaloun inhabitants.

For their water needs and over thousands of years, inhabitants of Meithaloun town depended on rainwater harvested from rooftops and stored in cisterns during rainy months. Additional quantities were also transported from Al Fawar spring to the southwest, near Jaba’a town. In the sixties, two private agricultural wells were drilled in the area from which people used tankers to transport the water to their homes and cover some of their water needs. In 1999, a municipal well was drilled for domestic purposes. However, due to its low discharge, people had to rely only on what was stored in cisterns, or were forced to purchase tanker water from private agricultural wells.

To mitigate their water problems the villagers formulated a vision. The vision was that by 2010, the average domestic water supply would increase from the current 52 l/c/d to 100 l/c/d. Furthermore, through land reclamation, and an increase in the irrigated areas agricultural activities would expand from the current 1,415 dunums to 5,000 dunums (out of a total of 13,710 dunums available arable land). Moreover, sources of underground water contamination would be limited and put under control, especially those arising from the absence of a wastewater network, and the infiltration of polluted water from neglected and un-maintained cesspits into nearby water cisterns.

The local stakeholders in Meithaloun collectively agreed on the two factors that were most important and most uncertain, and which were key for realising their vision. These two factors were: Availability of funding sources; and obtaining licences from Israeli authorities to drill an artesian well within village boundaries, or build water and wastewater networks. However, these activities are usually faced with many difficulties, and often fail in obtaining licences. Based on the above factors the stakeholders developed the following four possible scenarios:

<p>More Important and Less Uncertain</p> <ul style="list-style-type: none"> • Capacity of municipal staff to follow up and maintain pilots • Presence of a permanent water source 	<p>More Important and More Uncertain</p> <ul style="list-style-type: none"> • Funding • Licensing
<p>Less Important and Less Uncertain</p> <ul style="list-style-type: none"> • Quality of awareness programmes 	<p>Less Important and More Uncertain</p> <ul style="list-style-type: none"> • Quality of awareness programmes

⁴ Extracted from Moriarty, Patrick, Charles Batchelor, Firas T Abd Alhadi, Peter Laban, and Hazem Fahmi, 2007. The EMPOWERS Approach to Water Governance: Guidelines, methods and Tools. INWRDAM, Appendix 1

Scenario 1: Funding and licences are available.

Although it is considered as the best-case scenario to achieve Meithaloun's vision quickly, it is also believed to be the least likely to happen in the near future (2010), as this scenario assumes that a solution to the current political situation would have been reached, and consequently, availability and access to funding sources would become easier.

Strategy for scenario 1:

- Rehabilitate and maintain existing water sources, as well as locating new ones.
- Training workshops and capacity building campaigns to raise the awareness of both the consumers and the suppliers about water, and their ability to maintain the systems or household level units.

Scenario 2: Funding is unavailable, but licences are available.

Bearing in mind that, in Meithaloun, access to funds is usually easier than obtaining licences from the Israeli authorities, this scenario can then be considered as second best, since it would allow the implementation of projects/activities that would radically solve Meithaloun's water supply and wastewater-related problems. However, as with scenario 1, it is unlikely that scenario 2 would happen in near the future.

Strategy for scenario 2:

- Rehabilitate the existing water resources in coordination with municipality staff, local council and clients (end-users), as well as with related public and non-governmental organisations.

Scenario 3: Funding is available, but licences are unavailable.

This scenario is a very important to consider since it is the most likely to happen despite the current hard economic and political environment of the Intifada. When funds are available, many actions and activities, which do not require licensing, can be implemented, and whose impact would help alleviate Meithaloun's water-related problems.

Strategy for scenario 3:

- Rehabilitate the existing water resources;
- Promote the use of water harvesting techniques;
- Seek external water resources;
- Increase people's awareness on the rational and efficient use of water, strengthen capacity of the local field teams;
- Conduct feasibility studies and plan for implementing projects that promote the use of modern techniques in agriculture and irrigation.

Scenario 4: Neither funding, nor licences are available.

Although regarded as the worst-case scenario, it is still a very important one to consider. Not only because it reflects the current reality on the ground, but also because it needs to be taken into account while Meithaloun's strategies and plan-of-action are being developed.

Strategy for scenario 4:

- Increase the awareness at all levels of the need for better use of existing water resources, together with strengthening and training of local field teams.

Based on the visions, scenarios, and strategies that were developed by the community in Meithaloun, several interventions or pilots were proposed that would help the community in realising their vision. Two of the proposed pilots were selected for implementation in Meithaloun.

Annex 12. Ranking Criteria – An Example from The Kingdom of Tonga⁵

The Water Management Steering Committee (WMSC) in the Kingdom of Tonga had undertaken a situation analysis of the water sector in 2007. Subsequently the WMSC and stakeholders identified seven major concerns impacting on the water sector. The issues impacting on each of these seven concerns were then identified. These concerns and issues were prioritized and the WMSC determined that Groundwater contamination and quantity of existing supplies was of greatest national priority. Having identified the issue the WMSC had to determine a location within the Kingdom for establishing a demonstration project on the improvement and sustainable management of the groundwater resource.

Four aquifers were identified as possible sites for the demonstration project. The final site was selected through a Hot Spot Analysis⁶ whereby each site was tested against a predetermined list of criteria which had a weighting of 1 to 4 and a five-point rating system of < than 1%; 1 to 5%; 5 to 10%; 10 to 50% and > 50%. Each criterion then received a score. The template that was used by the WMSC is provided in the Figure on page 168.

Ranking Criteria: An example from the Kingdom of Tonga

No.	Name of the criteria	Weighting ¹	Rating	Score
1	Size of the affected area (as percentage of the total national land area)	1	1	1
2	Affected population (as percentage of national population)	3	4	12
3	Extent to which the natural watershed or aquifer and any associated receiving coastal and marine waters support the livelihood of local communities (e.g. subsistence or commercial farming, forestry, mining, tourism, fisheries)	4	5	20
4	Extent to which the natural watershed or aquifer and any associated receiving coastal and marine waters support the national development (e.g. commercial fishing forestry, mining, tourism, fisheries)	2	4	8
5	Extent to which the site is a recognized government priority (refer to National Sustainable Development Strategy, or other strategic action plans, e.g. NEAPs)	3	5	15
6	Extent to which the site is of regional and/or global significance and priority (See WWF ecoregions, IUCN categories, UNESCO World Heritage Sites, etc.)	2	5	10
7	Degree of degradation at the site (e.g. type of degradation)	3	5	15
8	Extent of degradation on watershed/aquifer and any receiving coastal and marine resources and systems	2	5	10

¹Rating: 1, less than 1%; 2, 1-5%; 3, 5-10%; 4, 10-50%; 5, over 50%

From: Hot Spot and Sensitive Areas for the Kingdom of Tonga. Based on the GIWA Methodology, available at http://www.unep.org/dewa/giwa/methodology/GIWA_Methodology_DA-CCA-POA_English.doc

All the scores were then placed in an aggregated scoring table at the end of which there was a total score for each site. This total score was the actual score with multiplications for weighting. There was also a normalized score for each site, i.e. as a percentage of a possible top score of 100.

5 Hot Spot And Sensitive Areas For The Kingdom Of Tonga. Available at http://www.pacificwater.org/userfiles/file/GEF%20IWRM%20Final%20Docs/Tonga%20HSA%20paper%2015_05_07.pdf

6 Based on the GIWA Methodology, available at http://www.unep.org/dewa/giwa/methodology/GIWA_Methodology_DA-CCA-POA_English.doc.

Annex 13. Template For An Action Plan

Foreword

Executive summary

1 Introduction

2 Vision

3 Strategy

- 3.1 Priority issues that have emerged from baseline assessment
- 3.2 List of strategic objectives
- 3.3 Strategy decided for Phase I
- 3.4 Overall budget (expenditure and sources of income)

4 Strategic objective 1

- 4.1 Action/project 1
 - 4.1.1. Priority issue addressed/background
 - 4.1.2 Specific objectives, indicators, targets
 - 4.1.3 Description of individual activities
 - 4.1.4 Lead roles in implementations
 - 4.1.5 Time and work plan
 - 4.1.6 Monitoring and evaluation
 - 4.1.7 Obstacles and risks
 - 4.1.8 Budget
- 4.2 Action/project 2
 - 4.2.1 Priority issue addressed/background
 - 4.2.2 Specific objectives, indicators, targets
 - 4.2.3 Description of individual activities
 - 4.2.4
- 4.3 Action/project 3
 - 4.3.1
- 4.4

5 Strategic objective 2

- 5.1 Action/project 1.....
- 5.2 Action/project 2....

7 Description of planning process and stakeholders involved

8 Outlook

Appendices

Source: *Local Government and Integrated Water Resources Management (IWRM)*' available at www.iclei-europe.org/logowater

Annex 14. Tips on Communication

- Check external perceptions of your centre/programme among potential target audiences before you start. This will help you develop a communications strategy that gives you a distinct and credible voice.
- Begin with a statement of your objectives in communicating the project; don't simply restate the objectives of the project itself. Make them clear, simple and measurable.
- Be clear on the principles underpinning your strategy. Some may be self-evident, like producing honest, succinct, credible and cost-effective communications. But also think about what you are prepared to do, and not do, as part of your communication strategy.
- Develop some simple messages and model how these might work in different contexts – a press release, a report, a newspaper article, a website page. Remember that you can be succinct without 'dumbing down'. Make sure your project is branded in line with your communication objectives.
- Be clear about your target audiences and user groups, and prioritise them according to importance and influence relative to your objectives. Don't just think about the 'usual suspects'.
- Think about both the actual and preferred channels your target audiences might use and challenge yourself about whether you are planning to use the right ones for maximum impact.
- Include a full list of all the relevant communications activities, developed into a working project plan with deadlines and responsibilities. Keep it flexible but avoid being vague.
- Keep it manageable and don't underestimate the time involved in communication. Include key deadlines, milestones and review points.
- Estimate the time and money involved. Ensure value for money by targeting communication effectively: prioritising the audiences and channels and focusing on high impact/low cost activity. Buy in specialist help where necessary.
- Build in some simple evaluation measures at the start so that you'll know if and how you have succeeded in meeting your communication objectives.

Source: www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Support/Communications_Toolkit/communications_strategy/top_ten_tips/index.aspx.

Annex 15. GEF-IWCAM Communications Approach

GEF-IWCAM Communications are implemented in three complementary but parallel and sometimes overlapping phases:

1. **Public Relations and Public Education** regarding the Global Environment Facility funded-Integrating Watershed and Coastal Area Management (GEF-IWCAM) Project's objectives, processes and benefits at the community and national levels.
2. Developing **Social Marketing – Behaviour Modification Campaigns** to encourage behaviour and attitudinal change to counter negative impacts and to promote sustainable practices.
3. **Documentation and Communicating Lessons Learned and Best Practice** in order to encourage replication of successful approaches.

Public Relations and Public Education

To educate and raise awareness amongst the wider public about the declining state of the environment of our watershed and coastal areas and of the benefits of adopting an integrated approach to their management, and, to keep GEF-IWCAM in the public's eye on a timely basis.

Activities to consider:

- Communications strategy
The outlining of a communications strategy is a useful exercise to conduct early. Clearly identify the objectives, processes and benefits of the project for key target audiences (including the community) at the local, national and regional level. A rapid assessment of communications capacity might be needed in order to ensure that the communications strategy is realistic, actionable and measurable. Ideally using Participatory Rural Communication Appraisal (PRCA) methods, establish baseline data concerning existing "knowledge levels, attitudes and practices (KAPs) "
- Project brochure
Project brochures should be simple and should clearly describe the objectives, processes and benefits of the project. Target audiences should be carefully considered – project partners? National and community level stakeholders? regional partners?
- Media GEF-IWCAM Workshop
Organizing a session to sensitize the media to IWCAM issues, whether a workshop or shorter format meeting, can be well worth the effort. It is an opportunity to introduce the media to IWCAM issues, to establish a network of contacts amongst local media and to get feedback from them on public interests and perspectives as well as preferred ways of receiving information from the project. Media information kits should be developed for and distributed at such events. They could consist of simple briefing sheets, contact information and any public education materials developed for the project. Media coverage of such an event should also be pursued so that the opportunity to reach the wider public as well is not lost.
- Media Releases
Media releases are distinguished from feature press articles in that they should be used to provide information on events, landmark project developments, and updates of public significance. They should be concise, relevant to public interest, and clearly provide information on who should be contacted for additional information or for interviews. They should ideally be followed up by a phone call, particularly if coverage of the event is desired. Key persons or "champions" referred to in the media release or who are spokespersons for the project should be prepared for

requests for interviews, whether in person or via telephone. Each IWCAM demo project should also have a 'timeline' for which key milestones should be achieved and should plan to have media releases and/or media events at each of these junctures.

- Profiles of key managers
- Feature press article/s
Establishing a contact at a local newspaper editorial department can be helpful in terms of placing feature articles, tip sheets and interviews. Feature articles written by the Project Manager, can be placed in national or local newspapers and regional magazines. Editors can be approached to determine their willingness to print single or short series of articles accompanied by an illustration. They are often willing to provide space free of charge (copy) provided that the articles are placed exclusively with them at the national level. News story ideas can also be provided to features editors. Alternatively, local journalists could be contracted to write articles. Feature articles should: help clarify project objectives at community and national levels; raise local awareness by showing the regional importance and interest in the work; build local media interest in the project.
- Media tours of demonstration project sites
Tours could be offered to several media representatives in a group. Such tours should be supported by media handouts which provide background, contact information and should also offer media the opportunity to interview key persons; particularly stakeholders who live in the local communities.
- Educational presentations and discussions on different thematic areas
The making of educational presentations on a range of different IWCAM related subjects to different groups, such as school children, youth groups, householders, farmers and developers is an important aspect of outreach and public awareness. Such fora should always allow for discussion and feedback from the audience i.e. should be as interactive as possible. If possible materials or handouts should be distributed as these can then be shared with those who have not been able to attend. Such materials also serve to reinforce the content or main lessons of the presentations. Knowing the audience beforehand and preparing thoroughly is important as presentations should always be appropriate (relevance, language, visual aids etc.) to the audience.
- Short radio messages
Radio is listened to extensively throughout the Caribbean and can therefore be an effective broadcast medium. Community radio in particular is listened to in areas where it exists. Short radio messages (two minutes or less) can be pre-recorded/produced and aired by arrangement on several radio stations, sometimes as public service announcements. The Government Information Service (GIS) is often available to assist with production in most Project Countries (PCs) and may make time slots for public service announcements (PSAs) available to the project.
- Video documentary/public service announcements (ideally, to be done with both a PR perspective in mind and an 'instructional' perspective for later communication of best practices
Establish contact with television news and current affairs editors and reporters. Providing news story ideas, tip sheets, media releases and videotaped coverage of events makes it easier and quicker for them to provide coverage, particularly as it is not always possible for them to reach remote areas. Some Demo Projects already have funds for the production of a video within their budget. Project video shots can be aired as public service announcements on local television stations or shown at public gatherings or meetings. Wherever possible, video footage

should be shot 'instructionally' so that later 'how to do it' best practice examples can be clearly communicated.

- 'Media event's for key milestones
Project milestones might be the introduction of a particular activity, facility, approach or the celebration of an achievement and, most importantly, would stress the benefits for the local or wider community. This last factor would determine the newsworthiness of the milestone being marked.

Social Marketing – Behavioural Modification

To focus upon the behaviours which are having the greatest negative impact upon the state of watershed and coastal areas and to promote changes in those behaviours by presenting practical alternatives. The aim here is to develop and implement a social marketing campaign which promotes changes in behaviour at the national and community levels. Key to the success of such a campaign is not only demonstrating the link between the behaviour and the negative impact but also upon presenting practical alternatives.

At the regional and national level it is possible to reasonably treat with the above in a "social marketing" campaign of limited duration. The PCU will design a campaign which:

- surveys decision makers and technocrats in different sectors to determine their level of understanding of the problems associated with watershed and coastal area management.
- targets decision-makers and technocrats at national and regional level (key actors) with the aim of sensitizing them to the issues of aquifer, surface water quality and land degradation and introducing them to some of the IWCAM resources and tools which can help them to address the problem.
- sends messages describing the extent of the problem (supported by figures and statistics etc.), presenting resources and tools being created, alternatives or actions already being undertaken by the IWCAM Project to address these and how these resources and tools can be accessed both during and after the project.
- creates opportunities for sharing best practice and lessons learned by the various demonstration projects.
- evaluates the impact of this campaign.

Document and Communicate Lessons Learned

The objective is to make information, resources and products developed during the GEF-IWCAM Project easily accessible to the public and to promote the benefits and lessons from the IWCAM Project to key audiences. Tools such as video and photo documentation are very useful. Advance planning is however necessary in order to incorporate these into reporting and documentation. This aspect of communications planning can have a significant positive impact upon the project sustainability. Information and resources developed as part of the project should be available to the many stakeholders well beyond the life of the project. A number of precuts could be considered as means of communicating best practice and lessons learned:

- Technical Reports
- Guides/ toolkits re. Legislation, Indicators etc.
- 1-page fact sheets or Decision-Makers Briefing Sheets
- Demonstration Project Case Studies Book
- Individual Demonstration Project Videos (in some instances already budgeted for)
- Focus meetings/workshops/seminars.

Annex 16. Communications Template Used by the IWCAM Project

Communications plan template

Part 1: Introduction: This should include a brief description of the current situation with respect to IWRM in the country and the key issues that need to be addressed in an IWRM plan. This material may be derived from the IWRM situational analysis.

Part 2: Objectives: This section should state the main objectives to be achieved as a result of execution of the communications plan. Keep the number of objectives to no more than four or five

Part 3: Key Messages, Primary Target Audiences, Format, Release Schedule and Cooperants. *(Note: the information below will need to be replicated for each key message theme)*

Key Message: This is the primary theme that is to be highlighted. These messages should be of high impact addressing the issues of highest priority

Primary Audience: Given the diversity of potential target audiences, the messages should be crafted appropriately depending on the primary audience being targeted. Messages in simple language are best for public audiences. More technical language may be used for professional public and private sector specialists; however, keep the message focused.

Format: List the range of media that the message will be conveyed in. This should specify products such as brochures, posters (along with size formats); video and radio features (whether short public service announcement or feature-length, along with specifications on duration, sound bytes, imagery).

Release schedule: Identify the proposed timing of release by month during the preparation of the IWRM Plan.

Cooperants: Identify the key persons, organizations that will be involved in preparation, facilitation and dissemination of the particular message.

Part 4: Proposed budget: The estimated cost for production and dissemination of the various media products must be specified.

Annex 17. A Case Study in Effective Communications from the Pacific International Waters Project

The Pacific International Waters Project (IWP) is working to strengthen the management of waste, freshwater and coastal fisheries in 14 Pacific island nations. The project is being implemented by the Secretariat of the Pacific Regional Environment Programme, which is based in Apia, Samoa. The Pacific International Waters Project was designed to help government agencies find cost-effective ways to help strengthen the community-based management of critical resources such as freshwater and near-shore fisheries. Strategic communications has played a critical role in raising awareness of environmental problems and in promoting the need for communities to adopt new behaviours to protect their fragile resources.

At the start of the Pacific IWP a Communications Specialist was employed by the Project's Coordination Unit to help the 14 National Coordinators to develop and implement their own communications strategies. The communications planning process greatly assisted many of the National Coordinators to clarify their objectives and target audiences and build much stronger relationships with their partners and stakeholders. They were able to use this planning process to improve their understanding of their target audiences, and determine the most cost-effective ways to raise awareness, promote new behaviours, and improve environmental indicators.

The first phase of communications activities focused on using media activities to raise greater awareness of the problems, the project approach, and the possible solutions and benefits at the community and national levels. The IWP's media outreach programme involved contracting journalists from the participating countries to write feature articles, radio programmes and television items. Every effort was made to use communications resources from within the Pacific Islands region – from journalists to filmmakers - in a conscious effort to build communications skills, experience, and capacity in the area of environmental communications. The success of this programme culminated in the IWP sponsoring the Pacific regions first environmental journalism awards in 2006.

With the support of the United Nations the project also commissioned a photographer to visit key project locations in an effort to personalise the problems and “champion” the people that were trying to address them. This small activity had a powerful impact in terms of raising awareness of the issues of pollution and declining coastal resources at the community and government levels. The photographs proved to be invaluable in the development of other media tools such as posters, articles, public displays.

The following examples show how a range of strategic communications tools and activities have been used to help achieve project objectives.

- 1. Championing waste management in Fiji** - One of the most successful communications initiatives in the Pacific IWP was a programme designed specifically to identify and promote environmental “Champions” at the community, national and regional levels. Promoting individual “Champions” helped to personalise the issue for a wider audience and highlight what people could actually do to address problems such as pollution and declining fisheries.
- 2. Using drama to model new behaviours in Vanuatu** - In Vanuatu the IWP trained 30 community facilitators to try and find ways to improve the management of coastal fisheries – particularly the land crab – in the community of Crab Bay on Malekula Island. Training in monitoring helped the facilitators improve the management of this “signal” resource through the use of tools such as taboo areas, size limits, and market quotas. However, the project needed to find an effective way to communicate these new management tools and behaviours to the wider community. The project facilitators worked with a well-known local theatre company, Wan Smolbag, to develop and performed a popular drama to help raise awareness of the problem and exactly what the community needed to do if it wanted to preserve its declining fisheries resources.

The IWP facilitators are now seen as “Champions” and advocates of resource management and they have been invited to explain their successes to other communities. Leah Nimoho, National

Coordinator for the Vanuatu IWP, says the key to delivering an effective communications programme is recognising the need to promote clear benefits. "To be effective any communications programme must be designed to help local stakeholders understand the problems, create a sense of ownership over the solutions, and motivate ongoing participation in management activities," she says.

3. Taking a step-by-step approach to reduce waste in Kiribati - The biodegradable Greenbag had already been promoted by an NGO as a potential tool to encourage people to keep their organics out of the country's new landfills. After assessing the existing situation the Kiribati IWP realised that it would have the biggest impact on reducing waste by encouraging the public and councils to adopt the Greenbag as a key waste minimisation tool.

The project set a target of achieving a 20% reduction in the volume of waste generated by the pilot community by the end of 2006. By the end of 2005 it had achieved a 50% reduction in waste volumes - a full year ahead of schedule.

The project employed a series of tools to promote the Greenbag including: community competitions, posters, radio jingles, talkback, community theatre, project videos, and community "champions". At the end of one Greenbag competition more than 10 tonnes inorganic waste had been removed from the pilot community. This built pride and confidence amongst the community and the sight of stacks of Greenbags during the competition raised curiosity from the neighbouring villages.

In order to build on its success at the community level the project began to lobby the local councils to adopt the Greenbag scheme as the basis of a new and more efficient user-pays system for the entire country. There has now been a great jump in the use of the Greenbag throughout the capital atoll of South Tarawa - from 3% in October 2004 to 17% December 2005. One year before project completion the Greenbag looks set to become a central tool in the country's fight against waste.

In the Pacific IWP there have been 4 keys to successful communications:

1. Find ways to help people understand the personal benefits of changing their current behaviours.
2. Keep messages simple.
3. Make it clear what you want people to do differently.
4. Start small and build on your successes with a wider audience

Accessed on 20 March 2010 at http://waterwiki.net/index.php/Communicating_for_Results_-_A_Communication_Planning_Guide_for_International_Waters_Projects#3._THE_COMMUNICATION_TOOLKIT

Annex 18. A Case Study in Effective Communications: Grenada

Issue/Scenario:

People are cutting down the Woburn mangrove for the purpose of burning coals that are sold to roast corn and barbeque vendors.

KAPS:

- People do not know that 75% of the fish caught on the eastern coast of Grenada are spawned in the Woburn mangrove.
- Coal burners do not know that the roots of these mangrove trees help in soil conservation and therefore help prevent soil erosion.
- People do not know that siltation of the nearby coral reef kills the reef and therefore can result in the loss of white sand beaches, a major tourism attraction.

GAPS:

- To educate persons on the illegality of their actions.(something for legal department)
- To explore alternative sources of energy (the energy unit)
- To train and provide employment opportunities for coal burners.

Audiences:

- primary audience - coal burners: generally men 25-50yrs.
- secondary audiences - roast corn vendors: mostly women 20-40 yrs; barbeque vendors: both sexes 25-45yrs.

Goal of the Education Strategy: To reduce by 25% the number of trees harvested from the Woburn mangrove for use in the charcoal industry.

Objectives:

1. To, within 1 year, increase the awareness that cutting trees in the Woburn mangrove harms the environment and significantly reduces the island's fishery stock
2. To have a well educated audience that understands and appreciates the importance of the Woburn mangrove to national development.

Communications activities:

- Group discussions with primary and secondary audiences on the negative impact of mangrove destruction (within 3 months of the campaign)
- Radio and television sensitization programmes (in the 1st year)
- Print materials (within 6 months).
- Publishing of success stories in the newspaper, and
- news releases to other media houses at the end of the campaign.

Indicators:

Outcome indicators

- 5 radio programmes produced and aired on 4 radio stations;
- 2 television programmes produced and aired on 3 television stations
- 1 brochure produced and distributed
- 2 meetings held
- 2 news paper articles published in 2 weeklies.
- 3 news releases distributed to all print and electronic media houses.

Process indicators

- educational materials produced
- 25% participation in the project

Impact indicators

- 40% fewer trees are harvested from the Woburn mangrove and used to produce coals
- 50% of roast corn vendors purchase coals from other sources
- 75% BBQ vendors now make the switch from coals from Woburn mangrove to other sources.

Source: IWCAM Project. Communications and Education Planning Guide

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- Save the Sand project, South Africa www.award.org.za
- Water Household and Rural Livelihoods Project www.nri.org/whirl

Glossary of Terms

Adaptive management	A type of flexible management in which actions, strategies and plans are continuously monitored and updated in the light of new information.
Aquifer	A geological formation that can yield useful water supply in wells and springs. Aquifers have two fundamental characteristics: a capacity for groundwater storage and an ability to support groundwater flow.
Awareness and sensitisation	A process by which an issue or problem or opportunity is brought to the attention of individuals or agencies so that it is given high priority in decision-making.
Capacity development	A long term and on-going process through which knowledge, skills and competencies of individuals, agencies and institutions are upgraded. This process includes all activities necessary for creating an effective and efficient enabling environment.
Catchment area	The area drained by a river or body of water
Ecosystem	A dynamic complex of organisms and their associated non-living environment, interacting as an ecological unit composed of primary producers, consumers, and decomposers.
Ecosystems approach	A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The ecosystem approach is guided by a conceptual framework—largely based on the Millennium Ecosystem Assessment (MA)—which acknowledges the interdependency of coupled ecological and social systems and recognizes the multi-dimensional aspects of human well-being.
Enabling environment	The policy, legal and institutional frameworks that allow stakeholders to participate in governance.
Entry point	The identified issue, which initiates the planning cycle. Tourism, for instance, has been identified as a good entry point for IWRM in the Caribbean.
Facilitator	A person who uses his/her skills to help a group understand their common and different positions so that they can reach a consensus on the objectives. The facilitator ensures that all interests are taken into account, but does not personally take sides.
Gender	Relates to the different roles men and women play because of societal and cultural expectations. A gender-based approach refers to the process of assessing the implications for women and men of any planned action, including legislation, policies and programmes in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political,

economic and societal spheres, so that women and men can benefit equally, and inequality is not perpetuated. The ultimate goal is to achieve gender equality.

Gender mainstreaming can be useful to ensure that the issues that affect women and men are part of analysis, programme and project planning, implementation, and evaluation. More importantly, gender mainstreaming can assist in bringing about institutional and organisational change necessary to ensure gender equality as an on-going commitment.

Governance	Water governance refers to the suite of political, administrative, legislative, and institutional systems that are in place to develop and manage water resources.
Indicator	A measurable marker for a condition that cannot be easily measured.
Information	Data that is captured and stored for retrieval. It is typically in written format, but also includes photographs, video recordings, diagrams, pictures, etc.
Integrated Water Resources Management	A process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. It is a progressive process in which the end point is reached through a web of individual initiatives that gradually remove the sectoral constraints.
Island Systems Management	An adaptive management strategy that both addresses the issue of resource-use conflict and provides the necessary policy orientation to control the impacts of human intervention on the physical environment of islands. It was developed by the Organization of the Eastern Caribbean States and adopted by the First Ministerial Meeting on the Implementation of the Barbados Programme of Action (held in Barbados in November 1997). Its effectiveness depends on an institutional and legal framework that coordinates the initiatives of all sectors, both public and private, to ensure the achievement of common goals through a unified approach.
Issues-based approach	An approach in planning that starts with an analysis of the problem and matches solutions to these problems. It contrasts with approaches which assume that problems can be resolved with universally applicable solutions.
Management cycle	The cycle through which a project or programme goes from initiation to planning, to execution and control and closure. For purposes of these guidelines, the management cycle has been expanded into a six-step process: diagnosing, visioning, strategising, planning, implementation and monitoring and evaluation.

Monitoring and evaluation	Monitoring is the continuous assessment of a programme or project to ensure that the scope is delivered on time and according to budget. Evaluation is the periodic assessment of the outputs in order to ascertain the extent to which the programme or project is having the desired effect or impact.
Objective Tree	A tool that depicts graphically the hierarchy of objectives. It is formulated by initially inverting the statements found in the problem tree. Afterwards, the inverted statements of the problem tree are rephrased to make the statements realistic and not improbable, and to remove absurdly stated inverted statements. The diagram is finalized by assessing the sufficiency of the interventions (objectives) identified and identifying new strategies (objectives) to meet the test of sufficiency. This tool is often used in tandem with the problem tree.
Participation	Having a stake in the decision-making process.
Participatory processes	A participatory process or approach seeks to engage all stakeholders in guiding and shaping their own development. This approach or process, over time, secures a lasting commitment and strong sense of ownership.
Partnership	Partnership refers to agreements and arrangements between agencies and organisations to work together to achieve a public policy objective by sharing resources and risks.
Plan	A formal, approved document that defines how the project is executed monitored and controlled. It may be summary or detailed and may be composed of one or more subsidiary management plans and other planning documents. The objective of a plan is to define the approach to be used by the Project team to deliver the intended project management scope of the project.
Problem tree	Helps find solutions by mapping out the anatomy of the problem. It looks upstream at causes and determinants and downstream at consequences and effects.
Process documentation	In the context of these guidelines, it refers to the capture and analysis of information in order to monitor and evaluate the rate of implementation and impact of a programme or project. It also refers to the preparation of lessons learned so that these can be used as best practices in future similar interventions. The Process documentation for a programme or project normally consists of all project reports, conference papers, working papers, videos, photos, audio material etc., which have been generated throughout the life of the project or programme.
Ridge to Reef	The area covering the entire hydrological system extending from the spring to the coastal waters. The concept allows for the understanding that on a small island, given the very small landmasses, all activities affect each other.

Scenario building	A process of analyzing possible future events by considering alternative possible outcomes (scenarios). Scenario building is a powerful tool for the decision-making process which brings together participants from all levels. By stimulating creative ways of thinking, scenarios help everyone from local farmers to national policy-makers in making decisions based on different possible futures.
Semi-structured interviews	Focused, conversational two-way communication to give or receive information. The interviewer has a broad framework of questions to start with but then allows the person being interviewed to move into other areas of interest.
Stakeholder	Anyone who is affected by or can influence a decision.
Stakeholder analysis	A technique to identify and assess the importance of key people, groups of people, or institutions that may significantly influence the success of an activity or project.
Stakeholder dialogue	A process of engaging people in serious discussion. It is also a designed and facilitated process for groups to initiate dialogue with those persons and institutions that have a stake in their activities. For purposes of these guidelines it refers to the interaction between different stakeholders to address specific problems related to competing interests and competing views on how water resources should be used and managed.
Strategy	A medium to long term planning framework within which specific activities to achieve the vision are identified.
Strategic planning	A management tool which provides for the identification of objectives and the development of activities to achieve the stated vision. It provides a broader context for understanding the problem that needs attention.
Triangulation	A method for corroborating findings and as a test for validity. For purposes of these Guidelines, this technique is used to ensure that an account is rich, robust, comprehensive, and well developed.
Up- scaling	The process in which projects are increased in size or replicated over space thereby addressing challenges relating to sustainability, cost and institutional capacity.
Vision	Defines the desired or intended future state of an initiative in terms of its fundamental objective and/or strategic direction. A vision is a long term view.
Vision statement	A general statement of what is aspired for in the future. For purposes of these Guidelines, a vision statement is an aspiration of the stakeholders as to how they see improvements in the management and use of water resources in the future, i.e. improvements over the issue that was initially identified.
Watershed	An area of land that drains water, sediment, and dissolved materials to a common outlet. Watershed boundaries always follow the highest ridgeline around the stream channels and meet at the bottom or lowest point of the land where water flows out of the watershed.

Acknowledgements

This Resource Book was reviewed at a meeting held in Saint Lucia from 24–26 August 2010. The participants at the meeting, listed below, were from the three main SIDS regions (Caribbean, Pacific, and Atlantic & Indian Oceans):

Nuno Ribeiro, Ministerio Ambiente Desenvolvimento Rural e Recursos Marinhos, Cape Verde; Shaheeda Adams Ibrahim, Ministry of Housing Transport and Environment, Republic of Maldives; Marlon Montano , Consultant, Seychelles Fernando Lima Da Trindade, Ministry of Building Infrastructure, Natural Resources and Environment, Sao Tome and Principe Marc Wilson, SOPAC Secretariat of the Pacific Applied Geo-Science Commission, Fiji Islands Isaac Lekelalu, Ministry of Mines and Energy, Solomon Island Sopoaga Semisi, IWRM Project, Samoa Milika Sobey, International Union for Conservation of Nature, Fiji Jacob Opadeyi, The University of West Indies, Trinidad and Tobago Anika Sutherland, Water Resources Authority, Jamaica Raymond Baptiste, Ministry of Agriculture, Grenada Marilyn Crichlow, Water Resources Agency, Trinidad & Tobago John Mwansa , Barbados Water Authority, Barbados Linnette Vassel, Women's Resource & Outreach Centre, Jamaica Laverne Walker, Ministry of Physical Development and Environment, St Lucia Faustinus Monero, Ministry of Agriculture, Lands, Forestry and Fisheries, St Lucia Farzana Leon, Ministry of Agriculture, Lands, Forestry and Fisheries, St Lucia Cornelius Isaac, Disaster Risk Reduction, OECS, St Lucia Trevalyn Clovis, GEF/IWCAM Demonstration Project, St Lucia Patricia Aquing, Caribbean Environmental Health Institute (CEHI), St Lucia Christopher Cox, Caribbean Environmental Health Institute (CEHI), St. Lucia Donna Spencer, GEF- IWCAM Project Coordination Unit, Caribbean Environmental Health Institute (CEHI), St. Lucia Sasha Gottlieb, GEF- IWCAM Project Coordination Unit, Caribbean Environmental Health Institute (CEHI), St. Lucia Vincent Sweeney, GEF-IWCAM Project Coordination Unit, Caribbean Environmental Health Institute (CEHI), St. Lucia .

www.unep.org

United Nations Environment Programme
PO Box 30552, Nairobi, Kenya
tel: +254 20 762 1234
fax: +254 20 762 3927
E-mail: unep@unep.org
web: www.unep.org



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