

Integrated Water Resources Management in Barbados: A Planning Perspective

Kwame Emmanuel MSc

UNESCO Fellow / PhD Candidate (Environmental Management), Department of Geography and Geology, UWI, Jamaica, kwamepe@hotmail.com

Commonwealth Association of Planners
Conference & Workshop
Barbados, June 2007

3 main presentation points

1. Improper management of the freshwater low availability is a threat to sustainable development and Barbados' development vision 2025
2. IWRM is a sustainable management regime for the low freshwater availability, which in Barbados' case should involve a revitalized approach to planning
3. SEA involving foresighting is a useful planning tool for a revitalized approach

Introduction

Barbados:

- Small, flat
- Upper-middle income country
- High population density
- High human development
- Service driven economy (tertiary)
- Tourism: main driver of development, largest source of foreign exchange.
- Environmental concerns
- Vision 2025: *"A fully developed society that is prosperous, socially just and globally competitive"*. (Government of Barbados 2005, 27)

Introduction

"The economic challenges we therefore face in large measures are those that arise not from too little, but from too fast a pace of economic expansion" (Owen 2006 p.2)

Problem: Situation

- Low freshwater availability ('absolute water scarce')
- Falkenmark's index – water stress (1667-1000m³/cap/yr), water scarce (1000-500m³/cap/yr), absolute water scarce (<500m³/cap/yr)
- Critique – food self sufficiency, human right, 'dooms day', water quality, adaptive capacity (Chenoweth in press)
- 301 m³/capita/yr, 1997 (FAO 2003 cited in UNEP 2005)
- 390 m³/capita/yr (Task Force 2002)
- 294.1 m³/inhab/yr (actual) for the period 2003-2007 (FAO 2004).
- "300 cubic metres per capita is a low water resources availability by world standards, but is more than ample maintaining a non-agricultural economy" (Chenoweth 2006b j.chenoweth@surrey.ac.uk).
- "Taking into consideration the drop in the amount of agricultural land and irrigated land, there is enough water to meet demand" (Mwansa 2006 interview) – management, efficient use

Water Availability and HDI

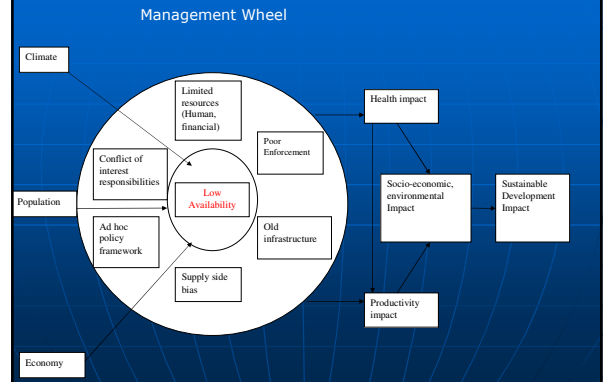
Country	Internal Renewable Water Resources, 1997 (per capita m ³ /yr)	HDI, 2006
Antigua and Barbuda	800 (water scarce)	59 (High)
Barbados	301 (absolute water scarce)	31 (High)
Cuba	3,404	50 (High)
Guyana	316,689	103 (Medium)
Haiti	1,598 (water stressed)	154 (Low)
Jamaica	3,651	104 (Medium)
Dominican Republic	2,593	94 (Medium)
St. Kitts and Nevis	621 (water scarce)	51 (High)
Suriname	211,031	89 (Medium)
Trinidad and Tobago	2,968	57 (High)

Dataset Sources: FAO 2003 Cited in UNEP 2005, UNDP 2006

Problem: Situation

- **Threat** to sustainable development - *Human health and welfare, food security, industrial development and ecosystems*
- **depending on how it is managed** – human ingenuity
- Inadequacies in present management regime
- Despite “We’ve done well so far compared to countries with higher water allocation which have water outages...” (Mwansa 2006 interview)
- Water scarce since 1950s based on definition of scarcity index - Falkenmark

Conceptual Framework



Policy Aim

- To develop an integrated (sustainable) approach for the management of the low freshwater availability in a primarily service driven, tourism dependent, small island economy.

IWRM and Demand Management

- **IWRM** - Aligning demand with supply in an equitable and environmentally friendly manner.
- **DM** - New management phase to meet water deficit (Turton 1999)
- DM – “...stresses making better use of existing supplies, rather than developing new ones” (Winpenny 1997 cited by Turton 1999)
- Managing competing demands
- **End user efficiency** – technological changes – ‘doing more with water’, ‘more crop per drop’
- **Allocation efficiency** – socio-economic changes – ‘doing better things with water’, ‘more value per drop’ (Turton 1999)

Policy Question

Main research questions:

- How has the low freshwater availability characteristic affected the development of the demand sectors and the Barbadian economy?
- **How can demand be balanced with supply in an equitable and sustainable manner?**

Secondary research questions:

- How is Barbados characterized by the structural water poverty index?
- How is sector demand explained?

Policy Response

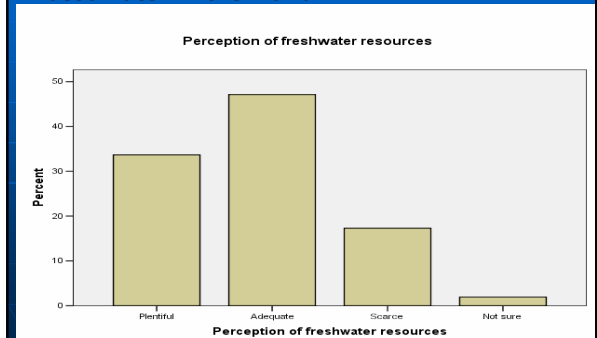
A revitalized approach to planning

Planning Concept

- Bias towards physical planning, UK (Gunn and Var 2002)
- Trend towards comprehensive planning (Gunn and Var 2002)
- Two new dimensions – social, economic (Gunn and Var 2002)
- "...a process for visualizing and guiding action to avert pitfalls and meet challenges in the future." (Gunn and Var 2002, 7) – also to optimize on opportunities
- "Planning is a multidimensional activity and seeks to be integrative. It embraces social, political, anthropological, and technological factors. It is concerned with the past, present, future. (Rose, 1984, 45 cited in Gunn and Var 2002, 6)

Public Perception and Participation

- Disconnect
- "best water in the world"



Public Allocation Priority

Demand Sectors	Priority rank	Mean	S.D.
Agriculture	2	2.03	0.830
Domestic	1	1.40	0.702
Tourism	3	3.62	1.095
Manufacturing	4	3.84	0.916
Environmental Conservation (ex situ)	5	3.92	1.194

Policy makers

- Development policies not seriously considering freshwater low availability
- Tourism water requirements only recently considered at the project level
- No established national carrying capacity (natural and technological)

Revitalized Approach – SEA Methodology

■ SEA

- Foresighting (future scenarios)
- Carrying Capacity

Strategic Environmental Assessment

- Policy on SEA (Draft), Government of Jamaica (2003)
- "A **systematic, proactive process** for evaluating the **environmental consequences of policies**, plans and programme proposals in order to ensure that these environmental consequences are fully included and adequately **addressed at the earliest appropriate stage of decision making**, on par with economic and social considerations" (Government of Jamaica 2003, 10)

SEAs

Coverage and focus (Jamaica)

Ministries/Agencies includes:

- Finance & Planning
- Transportation & Works
- Water & Housing
- Commerce, Science & Technology
- Agriculture
- Tourism & Industry
- Urban Development Corporation
- Jamaica Promotions (JAMPRO)
- All Local Planning Authorities

Process: No single methodology

- Jamaica: preliminary scan, scoping, mitigating measures

SEAs Vs EIAs

SEA	EIA
Policies, plans, programmes – broader framework ("Bigger view") – EIA not possible	Projects, activities
Assess the effects of environment on development	Assess the effects of development on environment

SEA Methodology: Foresighting

- Foresighting for Development Model – Prof. Anthony Clayton, ISD, UWI, Jamaica
- UNEP adopted – after Jamaican study on the future of the local sugar industry subsequent to price cuts
- "...adopted from planning practices used by large multinational corporations, and established in the developed world public-sector planning..." (Sheil 2007 www.jamaica-gleaner.com/gleaner/20070603/lead/lead5.html)
- Clayton noted "Governments have to deal with many immediate demands...But they must also take a long term view." (Sheil 2007 www.jamaica-gleaner.com/gleaner/20070603/lead/lead5.html)

Foresighting / Backcasting

Purpose (Clayton 2005):

- Identify key drivers of change and interactions
- Identify 'known unknowns'
- Assess impact of 'wild card' events
- Identify possible broad **outcomes (scenarios)**
- Backcast to present day (gap analysis re: **carrying capacity**)
- Build robust strategy for managing change (SWOT/LogFrame)

Foresighting / Backcasting

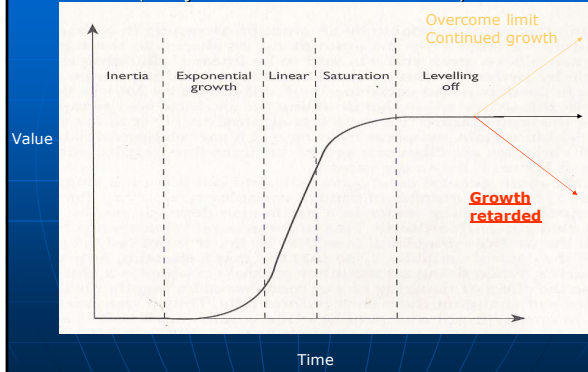
- User type: Large multinational corporations, governments
- Typical time horizon (years): 10-50+
- Participants: experts, stakeholders
- Typical numbers: 20-50
- Process: Facilitated discussion, present 'what if' challenges and counterfactuals
- Expert Role: Facilitate, challenge, manage process
- Key Challenges: identifying/recruiting key stakeholders, process facilitation, maintaining momentum

Clayton 2005

Carrying Capacity

- "The number units of a population that can be supported within a given area within limits of the natural resources, and without degrading the natural, social, cultural and economic environments for present and future generations." (Government of Jamaica 2003, 8)
- "...can vary throughout a year and is affected by the quality and quantity of available food, water, shelter and space." (ENACT 2001, 35)
- **Main factors:** population levels, resource demand patterns, environmental yield potential, resource flows, environmental absorption capacity, impacts (Clayton and Radcliffe 1996)
- **"The interaction of these factors determines the long-term viability of development processes" (Clayton and Radcliffe 1996, 89)**
- "...it is the aggregate demand of a population that will ultimately be limited by carrying capacity." (Clayton and Radcliffe 1996, 89)

Carrying Capacity and Development (Clayton and Radcliffe 1997)



Foresighting Example

- "...if you decided that you wanted to have a Caribbean expedition to the moon in 2020,
 - you could start by listing what that would require (rocket, launchpad, astronauts, ability to count backwards etc).
 - Then you could do a gap analysis (compare that list to what you have now).
 - Then you put your list of action points in a logical sequence.
 - During this process, it might become apparent that the task is unrealistic."
- (Clayton 2007 anthony.clayton@uwimona.edu.jm)

Give thanks...

"Water is life"

Questions and/or Comments?