

BRIDGING TROUBLED WATERS

An earlier discussion paper (“*The Politics of Water*”) addressed the growing significance of water as a national, regional and international policy concern. Since that time, the issue has assumed even greater importance with recent reports of a growing water supply problem in several Caribbean jurisdictions, Dominica included. In Jamaica, Trinidad and Tobago, Antigua/Barbuda, St. Lucia and Guyana, to name a few, a combination of lower than average rainfall, depleted storage capacity and problems in distribution have now necessitated aggressive conservation and consumption restrictions.

Alternative initiatives for addressing this problem in these severely impacted territories seem to be few. Some territories have already put into place sea water desalination plants having virtually exhausted their deep aquifer water reserves. Whether the causes of this threatening condition are cyclical (and to be expected) or whether they are primarily weather (El Nino) related and thereby unpredictable, or whether the problem is essentially consumption generated, secure supplies of natural fresh water can no longer be taken for granted.

Water has rightly been called the oil of the twenty-first century thereby highlighting its critical importance for economic development and social stability. Not so long ago, economists dismissively referred to water as one of the “free goods of nature”. This presumed a continuing availability of this resource at minimal cost except perhaps for production costs such as drilling, pumping, damming and artificial storage, purification, distribution, and perhaps eventual treatment prior to release back into the environment.

How times have changed! Natural water supply systems are endangered by decreasing precipitation rates; increased run-off due to deforestation and the expanding agricultural cultivation margin resulting in lower infiltration rates; higher rates of evapo-transpiration due to global warming, among other things. Managed artificial supply systems are confronted with erratic weather patterns, increasing frequency and virulence of storm events, low levels of investment recovery and other factors making it difficult to plan for storage, release and distribution of managed water resources.

What does all of this mean for Dominica? This island, like most of its sister Caribbean neighbors, is increasingly affected by water deficiencies whether caused by natural factors or by inattentive management. Among the more urgent concerns related to resolution of this problem are the following challenges:

- proper estimation of available water supplies within the various catchment basins;
- accuracy in estimation of drawdown from the available water supply from surface flows, infiltration, public utility storage, agriculture and related uses;
- identification of areas of impending water deficits to meet public demand requirements in the short term and long run;
- opportunities for linking supply potentials in adjacent catchment areas to meet projected needs;
- assessment of the implication of water removal from the natural system on the natural ecology (flora and fauna in the environment).
- Distribution costs and quality of supply to consumer associated with storage, both current needs and reserve; of treatment due to increased sedimentation and trapped chemicals.
- Apportioning production and distribution costs and benefits of potable supplies having regard to ability-to-pay tests and social issues such as health.

Within this complex decision-making framework, there is at least in Dominica the additional issue of an imminent program for bulk water exports from the island. It is easy to understand why this proposal might be an appealing prospect for the country. After all, every day millions of gallons of water flow from the land into the surrounding seas. It therefore might seem plausible that this presumed waste could be profitably captured and converted into a much needed revenue stream, providing needed employment and income. The details of this specific proposal are not available, at least to this observer, and so the merits remain questionable. One would assume that at least the following key factors would have been addressed by the policy-makers in the public interest:

- How much surplus water is currently available?
- In what watersheds do such surpluses exist, and will the exporter install and operate the facilities necessary to collect, treat, store and pump?
- Will the surpluses for export be available year-round on a fixed volume basis, risking the diversion of locally-needed supplies in times of drought?
- What would be the direct and indirect benefit to the nation?
- Would the agreement licence to extract water be a short term, medium or long term arrangement subject to cancellation, amendment or renewal and under what conditions or penalties?
- What consideration, if any, has been given to first supplying the water needs of regional (OECS, CARICOM and other Caribbean) partners?

The fact that one asks these questions by no means suggest that there is anything wrong in conducting an informative feasibility and environmental assessment as a precursor to an agreement to extract and export water. Certainly, from recent

reports, Dominica itself may also be faced with water supply problems related to drought conditions and is periodically subjected to public water supply deficiencies which should be the nation's first priority. Experience in other jurisdictions amply illustrate that water resource management is a highly complex issue requiring integration across a variety of policy areas. For Dominica, the following are perhaps relevant:

- (a) Currently, Roseau and environs draw much of their municipal water needs from piped supply from the Lake District, a system which also supplies power to the Trafalgar generation plant. The Lake District is a highly ecologically sensitive area, currently under stress and also considered a premium tourist destination. It has potential for boating, fishing, nature appreciation----all of which would be seriously compromised by constant draw-down.
- (b) The national water system is far from an acceptable standard in terms of access of the population to piped supplies, reliable availability of water when needed and in acceptable quality. There are areas of the country which are presently without piped water services and a priority government policy should be to make such services available. Even in districts with piped services, there are households which are not linked to the grid thus overstating the level of access and use. In 2001, approximately one-third of all households did not have piped water into their homes. (Table A). This situation is being addressed, but still has a long way to go.
- (c) As the country's population increases, the total volume of water may be expected to increase absolutely. Catchment areas unable to meet forecasted demand annually or seasonally may have to be linked to meet combined needs. In this sense, there are no remote areas of supply.
- (d) Even if the population does not increase significantly, but as we would all hope, the overall standard of living for the country as a whole improves, this inevitably translates into increased consumption of water per head or per household due to expanded rate of hook-ups, more water-consuming features per household, and increased usage for conventional requirements as baths, laundry, etc. Despite a flat-lined population, domestic water consumption per capita shows a steady increase. (Table B)
- (e) As Dominica looks to a policy of increased stay-over tourism, one concomitant is increased water consumption per tourist, which might approach established North American rates of 90-95 gallons/head/day. (Comparable 2003 figures for Dominica is 15.3 gallons/head/day, Table B). As has already been discovered in some of our tourist-island neighbors, their very successful hotel industry is in part to blame for seasonal water shortages. It should be noted that the tourist peak season is co-incident with the normal low rainfall season. Our local policy makers need to bear

this important relationship in mind both overall, and on a district level within the country!

There are many who rightly believe that especially as Dominica pursues a “compatible tourist option” for the country both as a transition strategy out of a dependency on the very unstable banana industry and towards Tourism as a desirable end pillar of development in its own right, the island must also pursue aggressively an alternative agriculture option of food security and a linked agriculture – tourism relationship. This must mean a well-designed, well-managed, intensively undertaken promotion of units of meat production, vegetables and fruits on a reliable and sustained year-round basis. Some indications of what this means for the livestock industry is illustrated in Table C.

Whether or not such a program is married to or independent of identifiable niche products based on a (fresh food) consumption-plus prospects or are designed for an organic foods market with higher value-added components, there is one persistent and inevitable condition, that is, success relies on a reliable, adequate and high quality water supply for both soil and spray irrigation and for proper animal husbandry.

It is therefore inconceivable to develop a Water Resources Management Plan solely within the context of providing potable water to consumers in the quality and amounts needed. Though that may be a major benefit from such a plan, water management is critical for a number of other consumer and non-consumer objectives. Water is a central feature of the living environment which in turn supports and maintains a stable natural environment. That environment is the context within which agriculture and forestry occurs, and domesticated animals and wildlife exists; it determines the quality of the air we breathe and the health of our society. A Water Resources Management Plan is the product of intersecting interests, natural resources and conservation, population and human settlement, agriculture, forests and wildlife, energy and power, tourism and recreation, industry. It underlies a need for integrated physical, social and economic planning.

Recommendations.

- 1. Especially for a “Nature Island”, there is an urgent need for an in-depth assessment of the country’s natural resource endowment, including its water resources.**
- 2. In the case of water resources, this might be followed by an integrated multi-purpose management and use program.**
- 3. Special attention needs to be paid to ecologically-sensitive water-based areas in terms of their conservation and protection.**

4. High capacity water catchment and recharge areas need to be identified and protected from adverse uses and practices particularly with regard to deforestation and erosion, high sediment loadings, infiltration of animal and human effluent, herbicides and pesticides.
5. The nation must engage itself in long range forecasts of water needs based on reasonable assumptions of population growth, expanding water distribution systems, rising standards of living, increasing non-resident (tourist) households; changes in agricultural practices to greater intensities and/or alternative crops; an emergent and expanding agro-industrial sector etc, to name a few.
6. Until these issues are investigated and understood and can safely be accommodated in longer term development programming, **bulk water exports should be sanctioned only as a short term expediency, guided also by considerations of regional versus non-regional countries of destination.**
7. Availability of reliable, high quality supply of water provides a major competitive edge for Dominica in a number of industrial operations and it is a surprise that this advantage has not been successfully exploited by our industrial promotion agencies. (See forthcoming paper in FRANKLY SPEAKING series, "*Made in Dominica....Guidelines for a National Industrial Policy and Program*".)
8. Despite the perception of an over-abundance of water, we all need to be reminded that this continuing supply availability is conditional on the level of demand. Secondly, we need to be reminded that there is a high and heavily subsidized cost of water availability in the amounts needed, in the quality expected, and at the locations required. The cost of piped water abuse must be borne by society at large so that policies of conservation and responsible use must be vigorously promoted at all levels.....at the corner stand-pipe left to run unnecessarily, to the widespread trend to air-conditioned (high water consumption use) buildings when thoughtful construction, materials and designs might achieve equally satisfactory results.

APPENDIX

Table A.

Percentage Distribution of Households by Type of Water Facility
Dominica, (1970, 2001)

<u>Type of Water Facility</u>	<u>1970</u>	<u>2001</u>
(a) Private, piped into dwelling	5.1	5.1
(b) Private catchment, not piped	2.2	2.3
(c) Public catchment, piped	1.5
(d) Public, piped into dwelling	8.3	46.3
(e) Public, piped into yard	7.4	11.7
(f) Public standpipe	51.1	27.3
(g) Public well or tank	0.7	1.2
(h) Other	25.2	4.5
TOTAL	100.0	100.0

(Excerpted from Table 7.3, Dominica Environment Statistics, 2004)

Table B.

Estimated (Domestic) Per Capita Water Consumption
Dominica, 1999 – 2003.

Year	Domestic Consumption '000 gals	End of Year Population	Estimated per capita Consumption (gals/day)
1999	342,000	71,644	13
2000	336,071	71,443	13
2001	358,543	70,401	14
2002	373,160	70,363	14.5
2003	395,108	70,340	15

(Excerpted from Tables 7.1 and 7.2, Dominica Environment Statistics, 2004.)

Table C.

Comparative North American Water Consumption Indices, 1950

(a) Rural Domestic Water Use per capita, (Dwelling with piped water)	50 gals/day
(b) Rural Domestic Water Use per capita, (Dwelling without piped water)	10 gals/day
© Urban Domestic Water Use per capita	95 gals/day
(d) Dairy cattle (per animal unit)	15 gals/day
(e) Other Livestock (beef etc)	10 gals/day
(f) Hogs	4 gals/day
(g) Three (3) minute shower	15 gals

Source: Lawrence S. Hamilton, "A Look at Agriculture's Competitors for Water", Cornell University, Ithaca, New York, 1962.