Liberlization of Services and Reforms

Discussion Papers: Volume 1

Water Reforms and the Poor

Practical Action (ITDG) South Asia publication

Introduction

Water Reforms and the Poor

The need for reforms in the water sector has been discussed in Sri Lanka for over two and a half decades. The implementation of a national water policy leading the way to reforms, however, is yet to be achieved in the face of continuous public resistance. At the centre of the debate is the dispute on the nature of the guidelines to be used in introducing reforms. Whether to identify water as an economic good and to introduce water allocation that is transferable in a market or to identify water as a right of humans and other living beings so that the management of water is done by properly implementing existing rules and adopting new approaches and practices is the debate at hand. The legality of water policies introduced so far, and ways to address the issue of sustainable access to water for all as well as assumptions based on which water scarcity is predicted are also important aspects debated within the Sri Lankan context.

Water reforms from a broader sense could mean the reformation of the water sector. The current worldwide trend in water reforms, however, is much more specific and is based on 'Integrated Water Resources Management' principles that encourage us to identify water as an economic good and propose the market as the best mechanism to manage water.

Recent interventions by Practical Action were focused on generating a discussion within the country on the possible implications of water reforms on the poor and proposing alternative approaches that could be taken into account in developing a national water policy that assures long term provision of water for all.

This volume consists of two discussion papers that provide insights in addressing pro-poor concerns in water policy.

- Implications of recently proposed water policies on the marginalized
  Gamini Kulatunga, March 2006
- A policy dialogue on water reforms to address the concerns of the poor
  Prasanna Ratnaweera, March 2006

Implications of recently proposed water policies on the marginalised

A study carried out for

Practical Action

By

Gamini Kulatunga

March 2006

Contents

1 Water resources management

1.1 Problem statement
(according to the policy makers and planners)

The following is an extract from the country paper presented at the Regional Meeting of National Water Sector Apex Bodies held in Hanoi, Vietnam in May 2004:

> The ongoing policy action in the water sector is influenced by a number of warning signals and emerging issues related to water due to lack of a regulatory domain. Traditionally past water resources planning and development were focused on maximising the utilisation of water for agriculture and hydropower. Currently the country is facing water shortages in other vital economic sectors and further resource development has become unaffordable as all the cost effective water resources are already exploited. Need for more efficient use and legal frame work for equitable water allocation to competing demands have been emphasised in the recent past. The current reforms and achievements in the water sector is largely based on establishing a regulatory domain to optimise already developed resource. Sri Lanka's quest for self-sufficiency in rice paddy has utilised a major share of developed resources. Since Sri Lanka has already developed almost all cost effective water resources, socio economic demands in the national development efforts need to depend on the existing resource. The main strategy in the management of water resources is demand management and transfer of resources to other vital economic sectors. Fundamental approaches for these have been formulated under the water rights and regulation of bulk water use. [Sri Lanka Country Paper 2004]

Similar views have been expressed elsewhere in many Government documents. Simply stated, this may be summarised in the following two statements:

i. Water in sufficient quantities and of adequate quality is not available at all places and at all times – there are spatial and temporal deficiencies, cause by increased water use and making water unavailable due to pollution.

ii. There is the possibility of intense competition for water in the future, and the 'market mechanism' is the fairest way of arbitration among contending users. The market will ensure that water is put to the best possible use, generating the greatest value-addition, for the overall benefit of society.

This argument assumes that there is (or there will be) a scarcity of water, and that a mechanism has to be found for an orderly transfer of available water from one use to another. At present, more than 85% of 'available' water is used for irrigation (mainly for paddy). Thus, the whole exercise is for the transfer of water used for (uneconomic) paddy cultivation to other uses, mainly 'domestic' and 'industrial'. Such strategies have resulted in unmitigated disasters in other countries [Grusky and Amenga-Etego, 2003]

There are a number of fallacies in these arguments.

Statement 1 above is obviously true. We are all only too familiar with the periodic droughts and the long lines of people waiting to collect water, not only in areas such as Hambanthota, but even in Colombo. But is the solution limited to sharing what little is available, using the market mechanism or otherwise? Why not look at the possibility of increasing the total amount of 'available' water so that all will have enough, and some to spare?

1.2 The drive towards a national water policy

The story of attempted water reforms in Sri Lanka has a chequered history. We will later see that this is in some ways similar to the pattern that has repeated itself in many parts of the world. However, it may also be seen as a somewhat unique experience, in that almost twenty five years after the initial proposals were made in the 1980s, the process is still almost at its starting point. In some countries, water reforms have been introduced in either of its two main forms (the British model, which is the more radical one, involves the complete transfer of ownership of water resources to the private sector while the other so-called public-private partnership transfers the control and management to the private sector while retaining ownership in the public sector), while in some others; the reforms have been wound back or are in the process of being wound back. In Sri Lanka, policies based on the recommendations of the International Financial institutions were brought forward for the first time in the early 1980s. Public agitation resulted in these being taken aback, revised, and presented as new proposals at various times. At one stage, the process proceeded as far as a Bill being presented to parliament. However, this was successfully challenged in the Supreme Court as being unconstitutional. A continuing dialogue exists at both the political and civil society levels on the nature of reforms required by the country. As at present there are up to twenty drafts of the water policy and over eight drafts of the Water Resources Bill [Ariyabandu 2005]. In March 2005 we were at the stage of a cabinet sub committee being appointed to come up with another water policy for Sri Lanka. This process was disrupted by the Presidential election of November 2005, but a new draft is before the cabinet of ministers by February 2006.

At the global level, the problems associated with the control and management of water resources has developed to such an extent that it is now said to be at crisis level. It is becoming increasingly clear that unless people-oriented holistic approaches are employed in addressing this issue, major health and food security problems are likely to overwhelm the world. The demand for water has been rising at twice the rate of population growth.

This is due to a number of reasons: increased per capita consumption, new and diverse uses for water emerging with changing technologies and lifestyles, and the spread of pollution. The situation is made worse by changing climatic patterns whose causes are still not well understood. Global warming is suspected to be one of the major contributory factors for the spread of recurring droughts.

As usual, it is generally the poor who suffer the most. The World Health Organization (WHO) estimates that more than a billion people do not have access to clean drinking water, and that more than twice as many people do not have access to decent sanitation. Eighty percent of them live in rural areas of the Global South. The 1997 United Nations Comprehensive Assessment of Freshwater Resources of the World concluded that one third of the world's population today already live in countries experiencing medium to high water stress. It is estimated that in Central and South Asia the annual withdrawal of water resources is more than 50% in comparison to the available amount.

A Number of major international conferences such as the Dublin Conference on Water (1992), Rio Earth Summit (1992), Mar Del Plata Action Plan of the UN Conference on Water (1997), and World Water Vision (2000) have stressed the need for preparing to accept this challenge. 2005 is the first year of a second UN decade for drinking water [Nanayakkara 2003]

Sri Lanka does not experience serious water problems, but seasonal water shortages occur from time to time. With the expansion of an urban environment one major issue in the water sector would be to meet the growing demand from competing users for domestic, agriculture, ecology and other sectors such as industry. There are frequent water scarcities in many parts of the country as a result of spatial and temporal variations in rainfall and changing weather patterns. It is within this context that the need for applying a rational, holistic approach in using water becomes even more urgent and themes such as water resources `use', `management', `conservation' and `development' have become important topics in national discussion, even though such phrases have often being used to camouflage proposals for mere water trading. .

As we have seen, most participants on the debate about water agree that, as at present, shortages of water availability do occur in Sri Lanka and that better management of water resources is imperative for assuring that water in adequate quantities and of acceptable quality will be available in the future.

However, agreement stops here, for there are wide disagreements about not only how to achieve this, but also about what the above statement really means. The disagreement revolves round the issue of access to water, whether it is a basic right (not merely a basic human right, but a basic right of all 'living' organisms) with its deep ecological implications, or whether water is to be considered as just another economic good, perhaps with some limited guarantees for the poor and disadvantaged.

There are at least four positions that can be identified under these two categories, along this spectrum of opinion:

i. Water is a basic right for all human beings (as well as of other living beings) and it cannot be 'owned' by any party.

ii. Water belongs to all people and so cannot be sold, even though a charge may be levied for water services which will include extraction, purification and delivery.

iii. Water for some is an economic good and for the majority it is a social good.

iv. Water is an economic good and free water withdrawals have to be stopped by bringing water under market mechanisms.

It is well recognised that in Sri Lanka there exists a centuries old perception of water as a public good, not subjected to private ownership. This has helped to sustain our lifestyles over two thousand years, and cannot be uprooted overnight, even if it is desired to do so. Well regulated arrangements for the management of water as a public good have existed for over two millennia, and the oft quoted remark of Parakramabahu (1153 – 1186 AD) on the necessity of utilising each and every drop of water before allowing it to escape to the sea illustrates but just one instance of this process. In the modern world, `management' is widely used in the international water reform discourse and is best interpreted using the Dublin Principles:

The Dublin Principles are [Wickramage 2000, Hoering and Schneider 2004]

i Water is a finite and vulnerable resource, essential to sustain life, development and the environment, which should be managed in an integrated manner.

ii Water resources management and development should be based on the participatory approach involving all relevant stakeholders, and making decisions at the lowest appropriate level.

iii Women play a central role in the provision, management and safeguarding of water.

iv Water has an economic value in all its competing uses, and should be recognised as an economic good, taking into account affordability and equity criteria.

The pro-water-management-using-market-mechanisms lobby perceives the concept of considering water as a fundamental right as idealistic and impractical, and at variance with the global trend. Its opponents consider the concept of `water management' to be another name for `watertrading' and that water should not be brought under private and individual ownership under any circumstances. The draft water policies developed by the Ministry of Agriculture, Livestock, Land and Irrigation in August 2004 and January 2005 consciously avoids the word `management' in its title.

1.3 Chronology of Sri Lankan Water Reforms

The following is a summary of the water 'reform' process in Sri Lanka during the last quarter century [Nanayakkara 2003, Ariyabandu and Aheeyar 2004, L H R D: 2002, 2003, 2004,2005]:

Date	Instrument	Authority	Provisions
1980	Water Resources Bill	Ministry of Irrigation, Power and Mahaweli Development	Bulk water allocation to various sectoral agencies (and further allocation by those agencies) and for the establishment of a National Water Resources Council (this legislation, however, was never submitted to Parliament due to lack of cabinet support).
1983	Irrigation Ordinance (amendment)		Enable farmers to be prosecuted for non-payment of water taxes.
1984			Commencement of charging water taxes from farmers.
1988	Policy of "Participatory Management of Irrigation Systems"		Substantial devolution of authority and responsibility to farmer organizations
1988	Irrigation Management Policy Support Activity (IMPSA)	International Irrigation Management Institute (IIMI)	
1992	Summary Report IMPSA	International Irrigation Management Institute (IIMI)	Recommendations on land, watershed and water resource management, and that the government should establish a high-level advisory National Water Resource Council and Secretariat.
1992			Proposal to carry out a water resources master plan was presented to external support agencies.
1993	Institutional Assessment for Comprehensive Water Resources Management (IACWRM) Project		Assess the institutional capacity for water resources management. The action plan of the project focused mainly on the need to develop a National Water Resources Policy, to establish a permanent institutional arrangement for water sector coordination and to prepare and enact "National Water Act'.
1994	Irrigation Ordinance was amended by Act No.13 of 1994		Enabled farmer organizations to levy charges from the members of the organization for the operation and distribution of water through canal systems.
1995		Cabinet	The implementation of the Strategic Framework and Action Plan for the "Institutional Strengthening for Comprehensive Water Resources Management (ISCWRM) Project.
1996	IACWRM project	Government	Establishment of a Water Resources Council (WRC) and a Water Resources Secretariat (WRS).
1996 to early 2000	ISCWRM project		Production of the "National Water Resources Policy and Institutional Arrangements" and the "National Water Resources Authority (NWRA) Bill"
28th March 2000		Cabinet of Ministers	Approval of the National Water Resources Policy.
September 2000		Legal draftsmen's department	Release of the Draft National Water Resources Authority Bill. (Government, however, failed to push the Act through the parliament and to establish NWRA).
2001			National Policy on Rural Water Supply and Sanitation was approved.
2001	The `100 day' programme	Ministry of Irrigation and Water Management	Setting up task forces for the implementation of its water management policy at 4 levels; Village Irrigation Committee, Divisional Secretariat Irrigation Committee, District Irrigation Committee and National Irrigation Committee.
2002	PRSP	GOSL	Published the Poverty Reduction Strategy Paper (PRSP) including proposed reforms on water sector.
2002	Regaining Sri Lanka	GOSL	PRSP was incorporated into the policy document "Future: Regaining Sri Lanka". Water reform policy was not taken for public discussions.

Date	Instrument	Authority	Provisions
22nd October 2003	Water Services Reform Bill	GOSL	Presented the "Water Services Reform: A Bill" to privatize pipe borne water supplies in the country in both rural and urban areas and public sewerage services. The Bill refers to drinking water and `other sources of water'.
2003 to 2004	Civil action	Supreme Court	Civil Society Organizations and citizens challenged the bill before Supreme Court and a decision against the introduction of the bill was given
August 2004	Basic Policies of Usage, Conservation and Development of Local Water Resources (Draft)	Agriculture, Livestock, Land and Irrigation Ministry	
September 2004	Water Resources Policy (Draft)	Water Resources Secretariat under the Mahaweli and River Basin Development and Rajarata Development Ministry	
22nd November 2004		The cabinet	Decided to amalgamate these two documents and come up with a common one
24nd November 2004	National Water Resources Policy (Draft)	The Special Presidential Task Force	The "common" policy document
21st December 2004		The Cabinet	The document was discussed, with the versions in Sinhala and English being significantly different from each other.
January 2005		The Cabinet	A four-member Cabinet sub committee was formed to come up with new proposals for a water policy.
June 2005	National Rainwater Policy And Strategies	Ministry of Urban Development and Water Supply	In the light of increasing operational and maintenance costs to, rationalize investments ,both by Government and non Government sectors, in the field of pipe borne water supply, drainage, flood control, soil conservation etc, and promote the practice on a Regional Community and family basis, in order to ensure that the 'City of tomorrow' applies Rain water harvesting broadly ,by the control of water near its source, in its pursuance of becoming a 'Green city' in the future.
8th September 2005	Draft National Water Resources Management Policy	Presidential Secretariat	Attempt to reconcile the "Basic Policies of Usage, Conservation and Development of Local Water Resources (Draft)" and "National Water Resources Policy (Draft)"
17th November 2005			Presidential election. At the opening of the new Parliamentary sessions, the President declares the need for a National Water Policy.
2 –12, December 2005	Aid-memoir on the proposed National Water Management Improvement (NAWAM) Project	Agreement between the Cabinet and the World bank	US$ 70 M loan from the IDA

Except for the "Basic Policies of Usage, Conservation and Development of Local Water Resources (Draft)" of August 2004 drawn up by the Agriculture, Livestock, Land and Irrigation Ministry and the "National Rainwater Policy and Strategies" of June 2005 drawn up by the Ministry of Urban Development and Water Supply, all other policy documents presented by the Government and parasitical organizations share a common vision. This will be discussed in detail in Chapter 2 of this report.

2. Basic features of proposed reforms

2.1 The Draft Water Resources Policy

The document is based on many implicit assumptions, without foundation.

The first introductory paragraph (Section 2) states 'with the transformation of the agrarian society into an urban society' as if the urbanisation of Sri Lanka is an accomplished fact. In reality, it is only one of the proposals contained in 'Regaining Sri Lanka', to transfer rural people to the cities en masse, so as to increase the proportion of the urban population to 50% of the total population. There are no proposals to provide housing or any other basic facilities for these people, and if it is done, the result would be identical to what has happened in other countries in Asia, Latin America and Africa – a vast increase in the number of slum dwellers and a drastic reduction in the quality of life of the transferred people. However, elsewhere in 'Regaining Sri Lanka', there are proposals of how to push them out of the rural areas. If water is made into a tradable commodity, they will of course have no access to water at all, for water will be beyond their reach.

The third paragraph of Section 2 states: 'Opportunities for further development of water resources being limited, expensive and fraught with socio-environmental issues, a greater part of the future demand has to be met from re-allocation of already harnessed water resources.' It may be true that new sources of tradable water resources are limited, but there is no dearth of non-tradable unused water resources.

If urban housing regulations are amended to require all new constructions to incorporate the harvesting of rain falling on the roof, to be used for the flushing of toilets and for watering the garden, the new demand for urban pipe-borne water can be drastically reduced at little extra initial cost and large long-term savings to the house builder. It will also reduce the flooding of roads that is now becoming common, even with the slightest shower. This is just one small example of the available opportunities for the development of non-tradable water resources. There are numerous other examples such as the small-scale harnessing of ground water.

Under 'objectives' (Section 4), the draft water resources policy lists a large number of vague good intentions about conservation, environmental protection etc., but the key objective is the one listed last. In the first version that was circulated on 30th November 2004, under the signature of the Additional Secretary to the Ministry of Agriculture, Livestock, Lands and Irrigation, this is given as: 'Encourage private sector to invest in the development of water sector'. The later version has this objective modified to read as: 'Encourage public private partnerships in the management of the resource'. This is another example of the cosmetic changes that are regularly made to hide the true intentions of the proposed legislation from the public. The private sector is understandably driven by the profit motive, and will have no interest except in tradable commodities and services.

'Public private partnership (PPP)' is an euphuism for the privatisation of the profitable components of an enterprise.

Under 'principles' (Section 5), there are a number of conflicting principles with no indication of how the conflicts are to be resolved. Reading between the lines, it is possible to discern that the market will be relied upon to resolve most of these conflicts. One example where even this is not possible is the centralised control of water resources and its devolution in accordance with the constitution.

That the market is not a suitable mechanism for the allocation of a fundamental right is well known, Apart from the poor who are routinely excluded from the market, it is not foreseeable that plants and animals will be able to intervene in the market

2.2 Water Services Reform Bill, 2003

In 2002, the Government of Sri Lanka (GOSL) published its Poverty Reduction Strategy Paper (PRSP), which was later incorporated into a general policy document in the form of "Regaining Sri Lanka". This was much more wide ranging in scope, but had been drawn up in the same spirit, and using the same processes, as the water management policy of 2000. The GOSL claimed at the time that this had been discussed and accepted by the people, but later had to admit that this was not true. The World Bank (WB), representing the International financial Institutions (IFIs), also had to admit that even though it demanded that such a document should be "publicly owned", this was not the case, and that in fact, it had been drawn up by a section of the Government following the strict instructions and guidelines laid down by the WB.

Out of all the initiatives discussed in Chapter 1, Water Services Reform Bill of 2003 was the only proposal that got as far as to be presented to parliament as a Bill for discussion and approval. The proposed bill defined its scope to include pipe borne water supplies to both urban and rural areas and public sewerage services. However, it is clear that it would have had a major impact on other water users, for it envisaged that licences will be issued giving licensees sole ownership rights to sources of water. In a country where 85% of water is used for agricultural purposes, this would have naturally created conflict situations. The bill specifically referd to drinking water and "other sources of water", making the point that these are not differentiable from each other. The PRSP envisages that the rural population will decline to 50% of the total from the present 75%, and that it will be necessary to provide domestic water services to double the present urban population within a short period.

The Water Services Reform Bill proposed:

i. Space for private sector involvement in water service provision.

ii. Handing over the functions of regulation to the independent regulatory body, Public Utilities Commission established under the Public Utilities Commission of Sri Lanka Act, No. 35 of 2002.

iii. Procedures for licensing of water service provision.

iv. The introduction of offences.

Civil Society Organizations and citizens challenged the bill before Supreme Court on three grounds:

i. The bill was a violation of the fundamental human right to water.

ii. It was 'unbalanced' in that it provided more protection water service providers than to the consumers.

iii. It was unconstitutional on the basis that water is a devolved subject and the bill needs the approval of all the provincial councils.

The Supreme Court decided against the Bill on account of the third objection, and did not go into the other counts, as the proposed Bill was deemed to be unconstitutional on this ground alone.

In the next section, we will attempt a broad comparison of some of the more important proposals for reform that have been presented in the recent past,

2.3 A Comparison of Water Policies

We have already discussed the history of attempted water sector reforms in Section 1.2. We will now attempt to analyse the following four major documents presented by various governments during the period 2000 to 2004 in terms of their principles, values and objectives *as stated in the various policy documents*:

i National Water Resources Policy and Institutional Arrangements, April, 2000

ii The section on Water Supplies, Sewage and Sanitation in Poverty Reduction Strategy Paper (PRSP), 2002

iii Local Water Resources Use, Conservation and Development (Draft), August, 2004

iv National Water Resources Policy (Draft, English Version), November, 2004

	National Water Resources Policy and Institutional Arrangements, April, 2000	**The section on Water Supplies, Sewage and Sanitation in (PRSP), 2002**	**Local Water Resources Use, Conservation and Development (Draft), August, 2004**	**National Water Resources Policy (Draft, English Version), November, 2004**
Aim / Vision	To ensure the use of available water resources in an effective, efficient and equitable manner, consistent with the social, economic and environmental needs of present and future generations.	Ensure safe drinking water (and high quality potable water for all household uses) to 85 percent of the population by 2010	The water policy from the broadest sense facilitates the activity of building the `excellent super human unit' (human society consisting of members possessing desirable characteristics). The policy envisages attaining self-sufficiency of food, economic and social independence through enhanced public participation.	To achieve a society that values the sustainable use of its water resources to realize a goal of an environment conductive balanced social and economic development
Scope	Applies to all fresh and brackish water and to all surface and ground water in Sri Lanka (marine water excluded)	Applies to drinking water supplies, sewage and sanitation	All water resources within the territorial boundaries of Sri Lanka that includes all fresh water sources, marine water and rain water	Applies to all fresh and brackish water in Sri Lanka (marine water excluded)
Policy principles	All surface and ground water are owned by the state. Managed by the government in partnership with `water users' on behalf of Sri Lankans Water has an economic value Public-private partnerships in water management and service provision.	Water is a basic human need but also has an economic value	The Sri Lankan government acts as the caretaker for all water and water related resources on behalf of the present and the future human generations as well as on behalf of all living beings dependent on those resources. Water use is a basic human right and has to be used without violating fundamental human rights Water is a property common to all living beings and non-living things and cannot be owed by individuals or groups of people.	All water resources including surface and ground water in Sri Lanka is a public property. Water is a basic need of all living beings. Water is a limited resource and has an economic value. Priority: Domestic needs followed by water for environment.

	National Water Resources Policy and Institutional Arrangements, April, 2000	**The section on Water Supplies, Sewage and Sanitation in (PRSP), 2002**	**Local Water Resources Use, Conservation and Development (Draft), August, 2004**	**National Water Resources Policy (Draft, English Version), November, 2004**
Rationale	As an integrated approach to address competition, water shortages, variable rainfall, degrading watersheds (sedimentation of reservoirs, floods and droughts), water pollution, ground water over-extraction. (This is only a management strategy.)	Growing competition for water among sectors, and lack of clear policy results in substantial water shortages in some parts of the country. This is mainly felt by the poorer communities, which depends on natural springs for their drinking water supplies, and small-scale farmers. The provision of clean drinking water, sewage, and sanitation services has exceeded government's institutional and financial capacity (investment requirement for 2001-2010 is estimated to be of Rs. 50 billion). This underscores the importance of attracting private sector investment into the provision of clean water.	Sri Lanka has enough water resources to face the expected grand water crisis but lacks policies to face the challenge. Though we get enough rain, certain areas get yearly droughts. The true reason for this is the negligence of tank system going along the foreign advice from the colonial era. Hence Sri Lanka needs plans for the appropriate use of water resources. Sri Lanka also needs a water policy that stops multinational companies owning national water resources.	As an integrated approach to address growing demand (as a result of competition in different sectors of water use, urbanization), seasonal water shortages, variable rainfall, ground water over-extraction and to achieve Millennium Development Goal of safe water for all by 2025.
Institutional arrangements	A permanent National Water Resources Authority (NWRA), a permanent Water Resources Council (WRC) and a Water Resources Tribunal (WRT) will be established at the national level.	Establishment of an independent regulatory authority that will set tariffs and regulate water delivery quality.	Current institutional structure is to be redefined and strengthened.	A National Water Resources Authority (NWRA), a Water Resources Council (WRC) and a Water Resources Tribunal (WRT) will be established at the national level.

	National Water Resources Policy and Institutional Arrangements, April, 2000	**The section on Water Supplies, Sewage and Sanitation in (PRSP), 2002**	**Local Water Resources Use, Conservation and Development (Draft), August, 2004**	**National Water Resources Policy (Draft, English Version), November, 2004**
Important features	Integrated water resources management: The right to use water will be granted through water entitlements containing terms and conditions regarding water extraction, granted for a fixed period of time, based on the specific water use. Voluntary transfers of water entitlements are allowed and not be restricted on the basis of the purpose of which the water is used (by creating a market value this increases water use efficiency and allows water to be moved to more productive users, in economic terms.) Open and participatory approach to water resources management. Bulk allocation of water to large users and group schemes. A fee is levied for the permit for bulk users. Shifting to higher value crops (e.g. specialized vegetable production, seed paddy, and bananas) Small-scale users and individual household water users supplied through group schemes will be exempted from the requirement to hold an entitlement.	Seeks full cost recovery in its tariff policy, removal of heavy cross subsidy for domestic consumers by non-domestic consumers Government continues expansion of access to water supplies and sanitation services in the rural areas, but with a more demand-driven orientation. NGOs and CBOs play an important role in rural water supply and sanitation. Local communities are fully responsible for the operations and maintenance. Potentially profitable service areas are demarcated and private sector is invited to enter into partnerships with the government to operate, maintain and extend water systems through long-term concession contracts, leases, management contracts and BOO/BOOT service provision. Private sector operators are given licenses to provide water supply, wastewater treatment, and sewage services for the major cities and towns. Local communities take the full responsibility for the operation and maintenance of local water supply and sanitation systems.	Holistic approach in water resources management. Reject privatisation of national water resources and dissolve processes leading to privatisation of water through water resources development and management. Water management is designed in relation to agrarian life by protecting the social and cultural traditions and taking into consideration the local knowledge and technologies. Reconstruction of tank system as a main element of water management. Protection of paddy farmer by identifying farming as the basis of agrarian economy. Strengthening state's role in mass scale water development schemes. Priority is given for location or region based water supply than designing systems depending on water supply from outside. Development of proposals and methodologies for water development is not done under local or foreign financial authorities. National water resources are not brought under local or foreign private investment or the investment of foreign states. Setting upper limits on ground water extraction.	Grant water rights to water users (for existing and new ones) through a system of permits to extract water from public water reserves. Permits are an instrument to allocate and define water rights among large-scale water users. Water rights are transferable subjected to national interest. Third party rights to water is recognized A fee is levied for the permit for bulk users (excluding service providing state agencies) Need to introduce legislation. Allocation of water for competing demands for its highest economic value. Encourage private sector to invest in the development of water sector. River basin /sub basin / connected basins are the hydrological unit for management. Ground water extraction is monitored and regulated. Integrated Water Resource Management approach is used. State promotes gender concerns in policies, plans and programs in water sector activities.

On the one hand all the policies taken into consideration here except for the `Local Water Resources Use, Conservation and Development (Draft), August, 2004' brought forward by the Ministry of Irrigation, believes in minimizing the role of state and bringing water under the market logic through

the participation of the private sector as the best way for effective water management, while proposing several measures to safeguard the right to water by the majority of small scale water users in both domestic and irrigation sectors. On the other hand the policy proposed by the Ministry of Irrigation suggests redefinition and strengthening of the state mechanisms as the best method for water use, conservation and development while recommending against the private ownership of water. This policy considers water to be a fundamental right of all living beings, even though its grassroots level implementation is still seen as a major challenge.

At an ideological level this discussion on water policies introduced in Sri Lanka takes us to visit more fundamental questions such as the ethics and the consequences of bringing one of the most fundamental needs, water, under private ownership, the effectiveness of market mechanisms to manage natural resources of the world compared to state mechanisms, the definition of `effectiveness' in management, analysing management from the point of view of who benefits, etc.

At a conventional level these policies need in-depth analysis to investigate and predict consequences of market involvement in water management on the poor and marginalized, the ways of issuing bulk water use/provision permits for a fee, allocating transferable water rights and using the concept of full cost recovery in supplying water. The policy documents that promote private sector participation in water management and could, thereby, introduce far reaching changes to a significant part of the Sri Lankan community structure (a structure that is built around a socio-economic and cultural relationship with water) is unclear on several crucial issues, such as the details of bulk extraction of water, definition of ownership to water given under permits, definition of `small-scale use' of water, rights of small-scale water users in a geographical region where a bulk user has got permits to extract water, etc. In this regard, experiences of other countries are useful in the investigation of the impacts of water reforms on communities, especially marginalized and poor communities.

3 The experiences of other countries

We will consider the experiences of a few representative countries that have implemented new policies for “managing” their water resources during the past few years.

	Report	Nature of reform	Experiences	Remarks
India	Water Tariff Increase: Rushing Towards Water Privatisation, Z Net Daily Commentaries, Vandana Shiva, December 15, 2004	The Delhi Government announced of a seven to tenfold increase in water tariffs. The increase has been announced to ease the way for privatization. The tariff increase is preparing the ground for Suez and other MNC's to harvest high profits at the cost of Delhi citizens.	Suez Degremont already has the contract for the Sonia Vihar plant which will get Ganga water from U.P, diverting the water of the Ganga canal at the cost of farmers of Western U.P.	The World Bank in its "toolkit" on private sector participation has stated: "Management contracts can be a good first step toward more full fledged private sector involvement where conditions make it difficult for the government to commit to a long term arrangement or to induce the private sector to undertake capital investment.
Southern Brazil	Brazil cuts Vivendi off in water deal: BBC News Sunday, 16 February, 2003,	Taking back control of the state water utility Sanepar from French group Vivendi. The company has monopoly control over water and sewage for the state's 7.5 million people.	The decision to remove the holding company in which Vivendi has a stake from the running of Sanepar comes after complaints about both water quality and under-investment.	"(The state government) understands that sanitation is not an activity to make a profit but a social service," a spokesman for Sanepar said.
Tanzania	Pipes run dry in Tanzania: Jeevan Vasagar in Dar es Salaam, Monday September 27, 2004 The Guardian	A British firm, Biwater, was brought in to manage the system. The World Bank and other donors provided Tanzania with a $143m loan to revamp the water network.	Water used to come through the taps in Tabata, Dar es Salaam. But these days the faucets and steel water pipes stand empty in backyards while families send their children to fetch water from a well.	In a report published today, the aid agency Action Aid warns: "As prices go up, the poor are likely to suffer most. There is already evidence that poor households are shifting towards unsafe water sources, with serious consequences for their family's health."
Malaysia	UK accused of using aid to promote privatisation: Duncan Campbell Monday September 27, 2004, The Guardian	PricewaterhouseCoopers advised the government on privatisation of the sewerage system, completed in 1993.	After complaints over rising charges and falling services, the government took the system back into public ownership in 2001.	"There is now a substantial body of evidence to show that privatisation of public services threatens to expose millions of people in developing countries to increased poverty," concludes the report. (from War on Want)

	Report	Nature of reform	Experiences	Remarks
Grenoble, France	Water and Power: The French Connection: The Centre for Public Integrity, Julio Godoy, PARIS, February 4, 2003	Although Grenoble had efficiently managed its own water for more than a century, Carignon (the mayor of Grenoble) had decided to privatise it to benefit himself and Suez, (the French Court of Appeal concluded). Grenoble's 25-year water concession was awarded to COGESE in 1987.	"From the very beginning of the privatisation, our water bills skyrocketed," Vincent Comparat, a leading city activist against the privatisation, told ICIJ. The contract with COGESE penalized the city for conservation. The company was allowed to increase the price of water if consumption fell below 12.8 million cubic meters a year.	The Grenoble water privatisation was one of the most notorious recent cases of French corruption. It laid bare the interlocking directories of power in politics and water, and revealed how the privatisation of water offered the perfect opportunity for personal and corporate graft.
South Africa	Cholera and the Age of the Water Barons: The Centre for Public Integrity, Bill Marsden, February 3, 2003 Metered to Death: How a Water Experiment Caused Riots and a Cholera Epidemic, Jacques Pauw, Johannesburg, South Africa, February 5, 2003	In 1998, local councils had begun taking steps to commercialise their waterworks by forcing residents to pay the full cost of drinking water.	But many of the millions of people living in the tin-roof slums of the region couldn't afford the rates. Cut off at the tap, they were forced to find water in streams, ponds and lakes polluted with manure and human waste. By January 2002, when the worst cholera epidemic in South Africa's history ended, it had infected more than 250,000 people and killed almost 300, spreading as far as Johannesburg, 300 miles away.	Making people pay the full cost of their water "was the direct cause of the cholera epidemic," David Hemson, a social scientist sent by the government to investigate the outbreak, said in an interview. "There is no doubt about that."
Ghana	Bank approves Ghana water loan; News, Bretton Woods Project, 21st September 2004|	In August 2004, the World Bank approved a $103 million loan for the privatisation of Ghana's urban water system, two months before the projected board date. While the World Bank has approved the loan, the Ghanaian government has still not formally opened the bidding process.	The Ghana National Coalition Against the Privatisation of Water (CAP) says that resistance to the privatisation of water will continue and the ultimate objective is "to ensure that access to potable water is available to all and guaranteed as a human right."	Rudolf Amenga-Etego of GrassrootsAfrica comments that the Ghanaian government must re-prioritise the national budget in favour of the water sector. However, this will only be possible if the international financial institutions are restrained.

	Report	Nature of reform	Experiences	Remarks
Buenos Aires, Argentina	The 'Aguas' Tango: Cashing In On Buenos Aires' Privatization, The Centre for Public Integrity, Daniel Santoro, February 6, 2003	In 1993, the government privatised the Buenos Aires water utility under heavy pressure from the World Bank, the IMF and the U.S. government. The government granted a 30-year concession to run the water system to Aguas Argentinas, a consortium controlled by two French corporate giants, Compagnie Générale des Eaux (now Vivendi) and Lyonnaise des Eaux (now Suez).	Within a year of winning its concession, Aguas Argentinas wanted to renegotiate its contract, claiming financial problems. Over the next eight years, important initial contractual commitments, including promises to extend water and sewerage to millions living in poor districts, eventually vanished like water into sand.	The consortium didn't pay a cent for the concession, but promised to reduce water rates and to improve and to expand water and sewage services One of the great ironies of the Buenos Aires water privatisation was that the public utility, the National Sanitation Services (Obras Sanitarias de la Nacion, OSN), had been a well-run company. It was not overburdened with debt and in fact had a surplus the year before privatisation.
Hamilton, Canada	Hard Water: The Uphill Campaign to Privatise Canada's Waterworks, The Centre for Public Integrity, Bob Carty, HAMILTON, Canada, February 13, 2003	Hamilton councillors thought the city could get in at the ground level by creating an international private water utility business. It turned its waterworks and sewage treatment operations over to a local waste management company. The city encouraged the company to chase down water utility contracts around the world using Hamilton as a model of privatisation.	Barely a year later, on a cold January morning in 1996, the dream began to unravel when Bill Baldwin went to check on the home of his vacationing sister. Opening the basement door, he found three feet of stinking raw sewage..	Hamilton had experienced sewage spills and backups before. But this was by far the worst on record — 182 million liters (48 million gallons) of untreated human waste, heavy metals and chemicals spilled into Hamilton harbor and then into Lake Ontario. More than 115 houses and businesses were flooded. The city would later place the blame for the spill on the operators of the city sewage system — private operators who had just taken control a year earlier

	Report	Nature of reform	Experiences	Remarks
Cochabamba, Bolivia	Public excluded from Bolivian Bechtel case: News, Bretton Woods Project, 1st April 2003 Bechtel drops case against Bolivia, News Bretton Woods Project, 23rd January 2006	In April 2000, US water multinational Bechtel Corporation was forced to leave Cochabamba following massive protests against average rate hikes of over fifty per cent. In 2002, the company filed the legal action against Bolivia at the World Bank's International Center for the Settlement of Investment Disputes. The company dropped its $50 million legal case in January 2006 against the people of Cochabamba for ending its contract to provide water to the citizens of Bolivia's third-largest city.	ICSID, the investment dispute tribunal of the World Bank, ruled that it would not allow the public or media to participate in proceedings in which Bechtel is suing the people of Bolivia for $25 million. The company is suing South America's poorest nation over its failed effort to take over the public water system of Bolivia's third largest city, Cochabamba.	NGO The Democracy Center says this sends a message to other corporations that "we will make you defend your actions in the court of world opinion, not behind closed doors where only a handful of lawyers has a voice".
Britain	Water bills 'set to rise dramatically' : Press Association Friday May 7, 2004, Guardian Unlimited	The water companies claim they need almost £22bn over the next five years for "capital investment" such as maintaining and updating ageing pipes, improving water quality and the environment and planning for additional consumer demand.	Water UK, which represents water suppliers, yesterday announced that the industry was pressing ahead with plans to raise bills by an average of almost 30% between 2005 and 2010. The move would mean households with a typical current bill of £240 a year will pay £310 by 2010 - but the final business plans released today are expected to reveal increases ranging from £47 up to £122.	Pete Bowler, campaigns officer at WaterWatch, agreed. "Water customers are being fleeced," he said. "Privatisation of the water industry hasn't benefited customers because the investment we have seen could have been funded at a much lower cost if the industry had still been in public ownership."

These are only a few typical experiences, and they were (at the time of the reports quoted) at different stages of the “reform” or “restructuring” process. There are many other cases, such as what happened when Vivendi and Suez took over the water and sanitation systems in Bhofolo and Queenstown in the Eastern Cape, South Africa and that of the small town of Walkerton, Ontario where seven lives were lost and more than 2000 people hospitalized when the town’s water source was contaminated with E. coli bacteria as a result of mismanagement [Council of Canadians].

Note also that the communities whose water and sanitation services have been subject to reform were economically diverse, from the poorest communities in Africa to the richest in North America, that the motivation and the driving forces for “reform” were at times different but that their experiences have been similar. In addition to their experiences regarding water and sanitation services, there have been, in most cases, a common experience of corruption, intimidation, and even arson and attempted murder.

We can visualise the process as consisting of a number of stages:

i Initial stage, when municipalities (and sometimes countries and their governments) are lobbied, cajoled and threatened by various parties (the international "donor" or lending agencies such as the World Bank and the IMF, national agencies of exploiting countries such as the DFID of the UK and GTZ of Germany, the big multinational water companies such as Vivendi and Suez, and local groups funded by these agencies or expecting to profit from their involvement) to follow the path of "reform".

ii The period of mass action by the people and their organisations against the handing over water resources and their control to multinational companies.

iii The third stage, of actual handing over of control.

iv The next stage, when the consequences become unbearable and the people start revolting against the "reforms" and demand their dismantling.

v The next stage when the reforms are overturned, usually along with the governments that introduced them.

vi The stage of legal action by the companies, trying to reassert their influence, with the help of their original sponsors, the International Monitory Institutions and the World Trade Organisation.

vii The final stage of settlement.

It is clear (refer Chapter 1) that Sri Lanka is still at stage (ii) of the above process and that the people of this country, with the assistance of the judiciary, have managed so far to prevent 'progression' to stage (iii). But the pressure for "reform" is continuing. The main arguments for reform have been (see section 2.2):

i The need to ensure the use of water resources in an effective, efficient and equitable manner. (Efficiency)

ii The provision of clean drinking water, sewage, and sanitation services has exceeded government's institutional and financial capacity (investment requirement for 2001-2010 is estimated to be of Rs. 50 billion). This underscores the importance of attracting private sector investment into the provision of clean water. (Investment)

As regards efficiency, this is what the World Bank [Estache and Perelman, 2005] which has been pushing the restructuring agenda throughout the world has to say about the relative efficiencies of public and private enterprises:

> "For utilities, it seems that in general ownership often does not matter as much as sometimes argued. Most cross-country papers on utilities find no statistically significant difference in efficiency scores between public and private providers."

As regards investment, we saw that one of the main motivations for the "reform process" in Sri Lanka is that:

> "The provision of clean drinking water, sewage, and sanitation services has exceeded government's institutional and financial capacity (investment requirement for 2001-2010 is estimated to be of Rs. 50 billion). This underscores the importance of attracting private sector investment into the provision of clean water." (see section 2.2)

Contrast this expectation with the case of Britain quoted above (this section) on how the water companies there are hoping to raise their investment capital!

4 The poor and the marginalised

4.1 Who are the poor and the marginalized?

There are many communities or groups of people who can be considered to be poor and marginalized, in the context of water. Many of them are the same as the poor when viewed from any other viewpoint, but there are a few who are specially disadvantaged with respect to access to water.

The following is a (perhaps incomplete) list of the poor and marginalized communities:

- The urban slum dwellers
- The rural poor (sub divided as shown below, in the context of water)
    - In the lowland wet zone
    - In the highland wet zone
    - In the dry zone
    - In the arid zone
- The plantation workers
- The coastal fisheries workers (for example, in Kalpitiya and Mannar)
- The poor in the war-affected areas

They have to be treated separately, for their requirements, and their problems, are different. In considering how the proposed water management policy would effect each of these communities, we have to bear in mind the central philosophy of the policy (as quoted in Chapter 1): “The main strategy in the management of water resources is demand management and transfer of resources to other vital economic sectors.”

We need to be aware of these “other vital economic sectors”, or the competing water users. Who are the competing water users? Some of the most obvious are:

- The middle classes
- The super rich
- Industry
- Corporate agriculture, Animal husbandry
- Hydro Power generation
    - Main hydro
    - Mini and micro hydro

When we consider the middle classes, their use of water bears a remarkable resemblance to water use by the poor, and is mostly for essential drinking and cooking, personal hygiene, washing and cleaning, horticulture, animals, pets etc. The main difference lies in the quantity and the quality of per capita water use. The urban middle class is used to consuming high quality potable water for all these uses, whereas the urban poor, especially the slum dwellers, find that they are short of potable water even for drinking and cooking. It is difficult to see any logic in the transfer of the miniscule amount of quality water that is today delivered to the urban poor to any other use, as is bound to happen with any proposal for marketing of water, even if it were only for cost-recovery. The experiences of other countries where this was attempted bear testimony to the very high human cost of such an exercise.

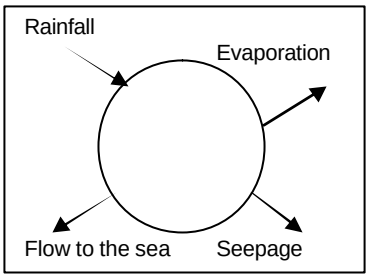
4.2 The influence on the poor and the marginalized

As discussed in the preceding sections, the effect of any proposals for "managing" water resources affects different sectors of the marginalized population in different ways. We will attempt to use the experiences of other countries discussed in section 2.4 along with the analysis of the various proposals for reform discussed in section 2.2 in arriving at the expected influence on the poor and the marginalized, as defined in section 2.3.

	National Water Resources Policy and Institutional Arrangements, April, 2000; **The section on Water Supplies, Sewage and Sanitation in Poverty Reduction Strategy Paper (PRSP), 2002;** **National Water Resources Policy (Draft, English Version), November, 2004**
The urban slum dwellers	Sri Lanka expectation: The provision of clean drinking water, sewage, and sanitation services has exceeded government's institutional and financial capacity (investment requirement for 2001-2010 is estimated to be of Rs. 50 billion). This underscores the importance of attracting private sector investment into the provision of clean water. Reality: Nowhere has private companies invested in services for the poorer sectors, as the risk of not being able to recover the investment (and profits) is too high. The intention of the Delhi Government and experiences of its people point to what will happen to this category of consumers under private sector management Another example is Bolivia, where millions of poor consumers were disconnected.
The rural poor in the lowland wet zone	Presently mostly dependant on domestic wells for drinking water and rain-fed agriculture for subsistence. There is no likelihood of pipe-borne water for domestic use (investment per capita is too high for profit-seeking private capital) under any of these three proposals. As there is no provision for pollution control, domestic water will become increasingly polluted as in Bangladesh.
The rural poor in the highland wet zone	At present, abundance of good quality water. However, in the absence of conservation mechanisms and the possibility of extraction of excess water for sale to high-profit consumers (urban rich and industry, including the tourist industry), likelihood of land instability, leading to increased risk of exposure to "natural disasters".
The rural poor in the dry zone	Dependant on irrigated agriculture for a living and dug-wells, village tanks and rivers and canals for domestic water, their condition is likely to be increasingly worsened due to transfer of irrigation water for "higher value" use, increasing pollution, degradation of the environment due to withdrawal of water availability for ecological sustenance. Already, the ecosystem has started deteriorating due to the concrete lining of irrigation canals based on the philosophy that water is only for those that pay.

	National Water Resources Policy and Institutional Arrangements, April, 2000; **The section on Water Supplies, Sewage and Sanitation in Poverty Reduction Strategy Paper (PRSP), 2002;** **National Water Resources Policy (Draft, English Version), November, 2004**
The rural poor in the arid zone	The arid zone has little irrigation and still less rain water. It is sparsely populated, and it is inconceivable that any for-profit company will invest in this area. What little river flow that reaches these regions is likely to be diverted to mare "high value" consumers before it ever reaches the region. This will affect not only people but also plant and animal life, giving rise to desertification. This is not a hypothetical situation, but a "normal" consequence of "pricing". A less intense, but still very acute situation in the US is described in the following quotation from [Manahan 1984]: The impact may be particularly severe upon agriculture. In south western U.S., for example, agriculture accounts for the bulk of water usage – 85% in California, 90% in New Mexico, 89% in Arizona and 68% in Texas. In some areas, industries and municipalities are willing to buy their water at prices up to ten times that paid for irrigation water. Particularly in Wyoming, Utah and Colorado, new energy industries are likely to put additional pressure on water prices. The increased cost of water could have marked effects on food prices and availability in the U.S. Water continues to be the subject of heated disputes among landowners and governmental agencies. One of the latest battles has been over the sale by South Dakota of Missouri River water from the reservoir behind Oahe Dam near Pierre, South Dakota, for use in a pipeline designed to transport coal as a slurry from the Powder River Basin near Gillette, Wyoming to markets in Arkansas and Louisiana. (Slurry is a mixture of equal masses of ground coal and water.) This inter-basin water transfer has resulted in considerable objection from states down-stream on the Missouri River.
The plantation workers	The plantation workers, as far as water and sanitation services are concerned, may be considered as rural slum dwellers. Although they live in areas with abundant water, access to quality drinking water and good sanitary facilities are almost non-existent. Centuries of over exploitation have left their mark on these peoples, and heavy investment in infrastructure is required for their wellbeing. Pollution of waterways by agrochemicals and bio waste are some of the water related problems that needs to be addressed. This can only be achieved through public investment.
The coastal fisheries workers	This is another disadvantaged group, with the additional burden that they live in areas with brackish water. Poverty and resultant lack of suitable housing are additional complications. They are virtually "unable to pay" for water, and so, any scheme that depends on the "willingness to pay" principle will leave them without access to drinking water.
The poor in the war-affected areas	These are arguably the most disadvantaged community in the country. Some internally displaced persons are have been living in camps for over twenty years, that is, in some cases, all their lives. Water and sanitation are major issues, impinging on health care as well. Only community based water services can reach these people.

5 Alternative formulations of the proble



Assuming that we would not be discussing fossil water and that we will not be concerned with mining deep aquifers (the expected yield is insignificant and the quality is suspect), we will consider only that water which forms part of the hydrological cycle over the landmass of Sri Lanka. It is assumed to be available cyclically, over and over again without loss, and will consider only a few entry and exit points:

Baring the 'arid zone' of about 10% of the land area, all other areas in Sri Lanka receive a minimum of 1 m of rainfall every year, with some areas in the uplands getting as much as 5 m. Thus, over the total land area of 65,000 sq. km, Sri Lanka receives a minimum of 100,000 M cubic meters of rainfall. As most water can be re-used a number of times before returning to the water cycle, the actual amount available would be much more than 100,000 M units. Our task should be to try to achieve this, rather than trying to ration out an insignificant part of this.

Now we come to the bulk of the 100,000 M units. A small part of this will be regulated and distributed through the existing large reservoirs, both irrigation and power sector reservoirs. But a major portion of it will have to be retained in the soil, mainly in the dry zone, achieved through delayed runoff, to be used not only by man, but also by all living things, both plants and animals. Land use practices appropriate for the uplands and the lower plains have to be identified and promoted, using both incentive and punitive measures. This will need new legislation.

In addition to enacting and enforcing new legislation, government intervention will be required for ensuring that the minimum requirements of the non-human environment (plants and animals) are met. This includes the reforestation of all state-owned upland lands in the sensitive catchments, restoration and maintenance of small tanks in the lower plains to ensure the maintenance of the water table, establishing tree-cover over lowland local catchments and unutilised dry zone lands to ensure retention of moisture, re-design of large irrigation schemes to ensure re-use of water.

In a very few instances, inter-basin transfer of water may become necessary, and this will have to be undertaken by the state as a necessary service to the community.

The above is a proposal for looking at this issue from, we believe, a new perspective. It is not a comprehensive analysis, but we hope it gives sufficient indications as to the intended direction. We will need to collect data relating to the different aspects (even data on evapo-transpiration, for example) before a complete policy can be evolved. Any policy will have to be adaptive to accommodate climatic variations with time.

One last comment on the use of market mechanisms. The market works very well when dealing with the supply of non-life-preserving commodities among consumers of roughly similar economic strength, and where a competitive market can exist. None of these conditions apply in the case of the provision of water. We shall later see some examples of this.

Rather than looking for mechanisms to transfer water from one type of use to another, water policy should aim at making more water 'available' Water availability may be improved by conservation, development and re-use. We should attempt to maximise the use (and re-use) of water between the entry and exit points. In effect, no water use should be considered totally 'consumptive' or 'non-consumptive', all will be consumptive to a degree.

This will be discussed in detail in a companion study.

Summary

This study examines both the theoretical and practical basis of the proposed reforms in the water sector and concludes that the formulation of the problem in its present form is subjective. It is constrained by the assumption that the only possible solution to the perceived scarcity of water is in better management of the presently available quantity of water, and that there is hardly any room for making more water available, through conservation, development or re-use.

In the case of most proposals for reform (with just two noteworthy exceptions) culminating in the Draft Water Resource Policy and the Water Services Reform Bill, the guiding principle has been that the only viable mode of management is through the market.

In order to study how the implementation of the proposed policies will impact on the marginalised, they are first categorised according to their particular situation in contemporary society. How similar groups have been affected by the implementation of market-led water reforms in other countries is considered, and these experiences are projected to the Sri Lankan situation to try to assess what will happen if the suggested reforms are implemented.

The study finds that the poor and the marginalised are bound to be very severely affected in the event the reforms are implemented. Finally, an outline of a new formulation of the problem is presented that may alleviate some of the problems raised.

References

.
Ariyabandu, R de S and Aheeyor, M M M: Secure water through demand responsive approaches – The Sri Lanka experience, Overseas Development Institute, 2004

Ariyabandu, R de S: National water resources policy – why can't we achieve concensus?, Daily News, 11th February 2005

Council of Canadians: Canada: privatization, contamination and nationalization, http://www.canadians.org/

Estache, Antonio and Perelman, Sergio: Infrastructure Performance and Reform

Grusky, Sara and Amenga-Etego, Sara: Water Privatisation in Ghana: Exploring options to government and World Bank policies, 2003.

Hoering and Schneider, 2004: Dublin Principles

in Developing and Transition Economies: Evidence from a Survey of Productivity Measures, World Bank Policy Research Working Paper 3514, February 2005

Lawyers for Human Rights and Development: Reports, 2002, 2003, 2004,2005

Manahan, Stanley E.1984:Environmental Chemistry, 4th Edition, Brooks/Cole, California, p. 12.

Nanayakkara, V K: Sri Lanka's efforts in introducing water-sector policies and initiating related institutional development, 2003

Sri Lanka Country Paper, National Water Sector Apex Body, Regional Meeting of National Water Sector Apex Bodies (18-21 May 2004, Hanoi, Vietnam)

Wickramage, M, 2000: 'Integrated water resources management', The national engineering conference on engineering for the emerging millennium, IESL, October 2000.

A policy dialogue on water reforms to address the concerns of the poor

A study carried out for

Practical Action

By

Prasanna Ratnaweera

March 2006

Contents

1 An alternative model for water use

1.1 Water use, priorities and quality

Having noted the adverse effects of the water management models presented so far in a companion report, we propose an alternative model for water use and management based on an equitable sharing of water resources. The market mechanism embedded in most of the water reforms proposed relies on the market for the allocation of water. We see from almost all the examples that have been documented that this leads to the withdrawal of water services from the poor and the marginalised. In addition, these reform structures do not allow for the water requirements of non-commercial environmental needs. It is also very wasteful to use expensive high quality water for applications other than for potable water needs. We propose a model where water requirements are classified by both priority and quality.

The following table shows the approximate water requirements of different users, classified by quality. It also proposes a limited mechanism for reuse.

User category	Usage (examples)	Per capita use (m^3 per annum)	Priority	Quality	Reuse
Personal and domestic use	Drinking and cooking Sanitation, bathing Home gardening Washing cars, animals	40 30 20 10	1 1 3 4	1 2 4 3	All domestic used water to be directed to a soakage pit to maintain the water table.
Public use (small scale)	Public sanitation Dispensaries	Average over the total population: 50	1 1	2 1, 2	
Public use (medium scale)	Hospitals, rural hospitals. Market place Recreational facilities		1 2 3	1, 2 2 2	
Public use (large scale)	Regional and National hospitals Schools, Universities Recreational facilities		1 2 4	1, 2 2, 3 2, 3	
Private use (small scale)	Kiosks, food parlours etc.		2	2	
Private use (medium scale)	Restaurants Industrial processing facilities Car service stations Tourist resorts	Average: 150	2 3 4 4	2 2, 3 3 1, 2. 3	All commercial and industrial users to be required to recycle used water.
Private use (large scale)	 Agriculture – Paddy Food processing facilities	Average: 1500 50	 2 2	 4 1	Irrigation systems to be redesigned to enable used agricultural water to be used for downstream agricultural use.
Regional Needs *	Trans-basin requirements Power Generation	1500 150	4 4	3, 4 3, 4	*These are reused in the irrigation systems.

If these are re-arranged by water quality, the approximate total annual requirements would be as follows, assuming a population of 20M:

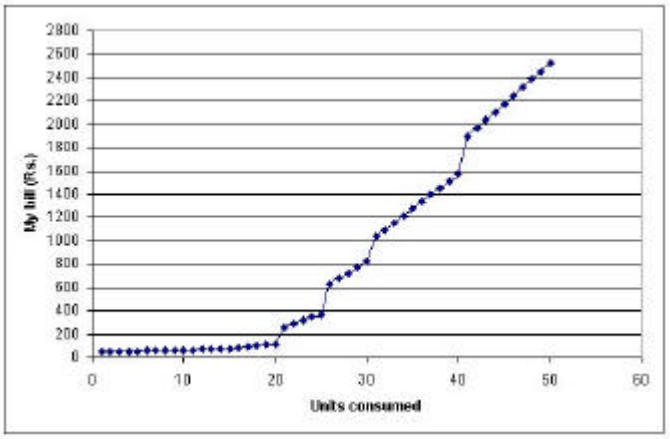
Water quality	Gross requirement		Reuse		Net requirement	
	Per capita m^3	Total MMC	Per capita m^3	Total MMC	Per capita m^3	Total MMC
1	150	3000	100 ?	2000?	150	3000
2	150	3000	50, 50 ?	1000, 1000?	150 – 100 = 50	1000
3	100	2000	20	400	100 – 100 = 0	0
4	1500	30000	500	10000	1500 - 500	20000

These figures have to be compared with the present practice, where almost all requirements other than those in agriculture are expected to be met with top quality (quality 1) pipe borne water, with no reuse even in agriculture. This would require the following quantities:

Water quality	Gross requirement (Present practice) Total MMC	Actual amount supplied Total MMC	Net requirement (Alternative proposal) Total MMC
1	8000	1500	3000
2	0	0	1000
4	30000	8500	20000

These requirements are of course not adequately met at present (especially domestic water needs) [Ariyabandu and Aheeyor 2004] and it is this and the need to meet expected increases in industrial water use that are used as arguments for the proposal to turn water into a marketable commodity. Market mechanisms are expected to reduce the demand for top quality water from poor domestic consumers and also transfer some of the water currently being used for agriculture into future industrial use. Because of high capital accumulation in the industrial production and service sectors (while there is insufficient investment in the agricultural sector even to maintain minimum productivity levels), value of water in agriculture will be lower than industry, and hence, market mechanisms will favour such a transfer.

The assumed domestic consumption of 100 m^3 per capita per annum may be justified on the basis of the present water tariff. The monthly household water bill in terms of consumption is shown below:



The rates are based on an assumption of a 'reasonable' use of about 20 units (m^3) per household per month, to be supplied at a comparatively low rate. This works out to about 5 units per capita (assuming 4 persons per household) per month or 60 units per capita per annum. We have allowed a more generous allocation of 100 m^3.

In agriculture, the current usage of 8500 MMC only accounts for irrigation water. It does not count rain-fed agriculture as the interest of policy makers has been only on those resources that can be easily commoditified. However, some of the proposed policies would reduce the water available for rain-fed agriculture. In our model, the water available for agriculture (which includes both rain-fed and irrigated agriculture as well as water for maintaining the water table) is as high as 30,000 MMC.

We see that neither the domestic requirements nor the agricultural requirements are adequately met at present, but the proposed reforms are aimed at transferring this scarce resource to "more high value" use. The proposals do not address the issues of meeting the "low value" demands of the poor, or of harnessing the vast amount of water that is potentially available. The alternative model requires a total of 24,000 MMC of "virgin" water annually to meet all expected water requirements, including vastly increased allocations to both industry and agriculture. This is less than 25% of the annual precipitation, and is well within the realm of the possible.

1.2 Water balance

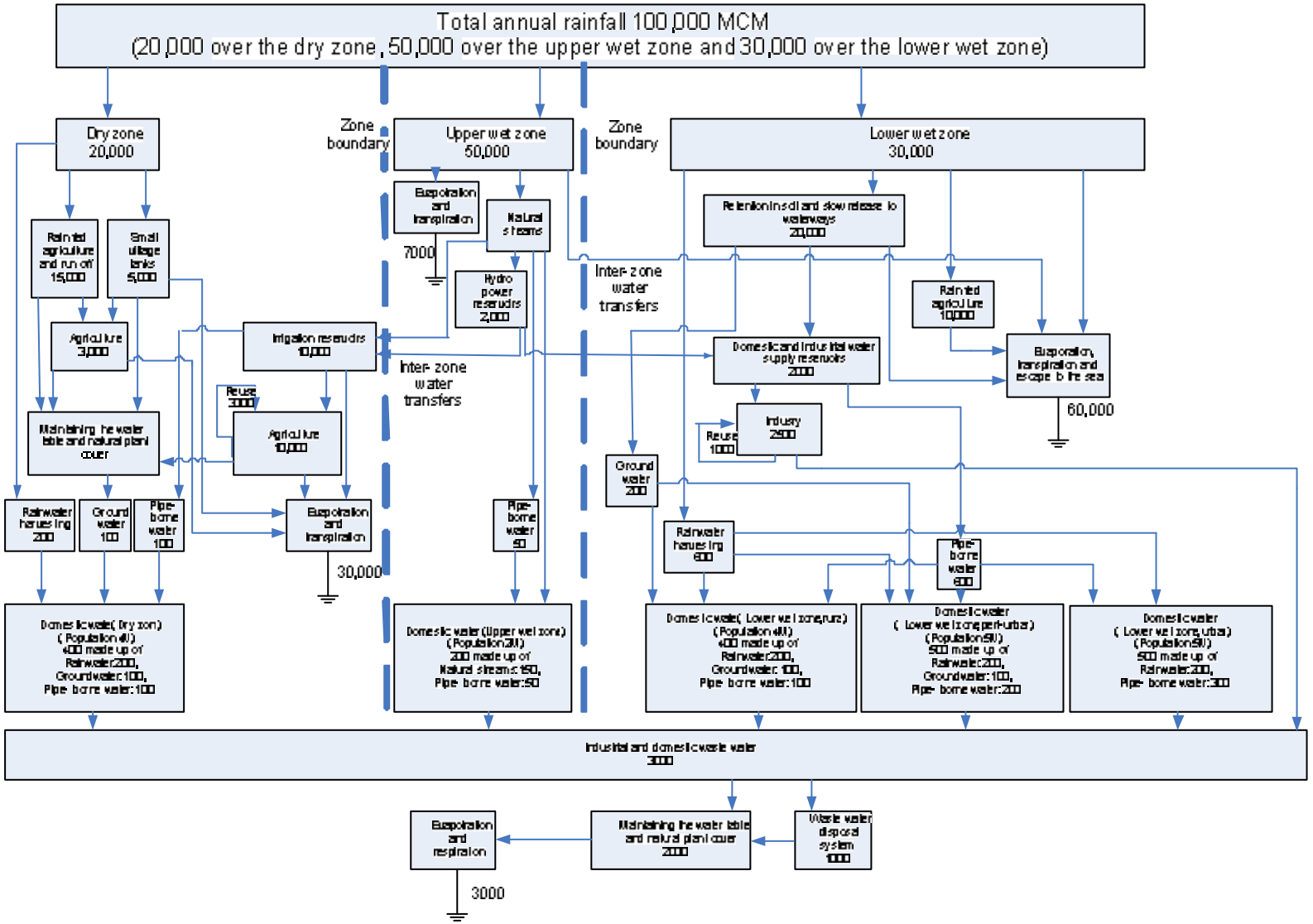
The alternative proposal is best described in terms of the proposed water balance.

In deriving the water balance, certain approximations had to be made, as the available data on precipitation, run off etc, are not always compatible. These inconsistencies may be considered to reflect the level of accuracy. However, all attempts have been made to keep the figures as accurate as possible, and when in doubt, conservative estimates of precipitation have been used. We have assumed a total precipitation over the entire island of about 100,000 MMC, whereas [Ariyabandu and Aheeyor 2004] use a value of 108,000 MMC, and the atlas [Sri Lanka Atlas 1988] gives a total precipitation of more than 128,000 MMC.

Difficulties were also encountered in zoning. In the diagram above, we have used three zones, the dry zone, the upper wet zone and the lower wet zone. The atlas recognises only two zones, the dry zone and the wet zone. In addition, it uses a classification based on river basins. Even though this is technically sound, we have the difficulty that whole basins have to be assigned to one of two zones. For example, the Mahaweli basin is assigned to the dry zone as a major part of the basin lies in the dry zone. However, most of the precipitation occurs in the upper reaches, which is in the wet zone. We need to take these and other similar factors into consideration in interpreting the data.

This is illustrated in the map.

The figure shows the proposed water balance:


Total annual rainfall 100,000 MCM
(20,000 over the dry zone, 50,000 over the upper wet zone and 30,000 over the lower wet zone)
Dry zone 20,000
Zone boundary
Upper wet zone 50,000
Zone boundary
Lower wet zone 30,000
Rainfed agriculture and run off 15,000
Small village tanks 5,000
Agriculture 3,000
Irrigation reservoirs 10,000
Inter- zone water transfers
Evaporation and transpiration
7000
Natural streams
Hydro power reservoirs 2,000
Retention in soil and slow release to waterways 20,000
Rainfed agriculture 10,000
Evaporation, transpiration and escape to the sea
60,000
Domestic and industrial water supply reservoirs 2000
Industry 2500
Reuse 1000
Ground water 200
Reuse 3000
Agriculture 10,000
Maintaining the water table and natural plant cover
Rainwater harvesting 200
Ground water 100
Pipe-borne water 100
Evaporation and transpiration
30,000
Pipe-borne water 50
Rainwater harvesting 600
Pipe-borne water 400
Domestic water(Dry zone) (Population 40) 400 made up of Rainwater:200, Groundwater: 100, Pipe- borne water: 100
Domestic water (Upper wet zone) (Population 20) 200 made up of Natural streams: 150, Pipe- borne water: 50
Domestic water(Lower wet zone,rural) (Population 40) 400 made up of Rainwater:200, Groundwater: 100, Pipe- borne water: 100
Domestic water (Lower wet zone,peri-urban) (Population 50) 500 made up of Rainwater:200, Groundwater: 100, Pipe- borne water: 200
Domestic water (Lower wet zone,urban) (Population 50) 500 made up of Rainwater:200, Pipe- borne water: 300
Industrial and domestic waste water 3000
Evaporation and respiration
3000
Maintaining the water table and natural plant cover 2000
Waste water disposal system 1000

1.3 Precipitation

The table below shows the precipitation in the different regions according to the atlas, in comparison with the figures in our model:

	Definition		Total precipitation MMC		Transfers MMC	
	This model	Atlas	This model	Atlas	This model	Atlas
Upper wet zone	Rainfall > 3500 mm per annum	River basins of: Bentota Ganga, Madu Ganga, Madampe Lake, Telwatta Ganga, Ratgama Lake, Gin Ganga, KoggalaLake, Polwatta Ganga, Nilwala Ganga, Sinimodera Oya, Kirama Oya, Rekawa Oya, Urubokka Oya, Deduru Oya, Karambalan Oya	50,000	45,000	- 40,000	- 25,000
Lower wet zone	3500 mm > Rainfall >2000 mm	Ratmal Oya, Maha Oya, Attanagalu Oya	30,000			
Dry zone	Rainfall < 2000 mm	River basins of: Kachigal Ara, Walawe Ganga, Karagan Oya, Malala Oya, Embilikala Oya, Kirindi Oya, Bambawe Ara, Mahasilawa Oya, Butawa Oya, Menik Ganga, Katupila Ara, Kurunde Ara, Namadagas Ara, Karambe Ara, Kumbukkan Oya, Bagura Oya, Girikula Ara, Helawe Ara, Wila Oya, Heda Oya, Karanda Oya, Saymena Aru, Tandiadi Aru, Kangikadichi Aru, Rufus Kulam Aru, Pannela Oya, Ambalam Oya, Gal Oya, Andella Oya, Thumpankeni Tank, Namakada Aru, Mandipattu Aru, Pathanthe Aru, Vett Aru, Magalavatavan Aru, Mundeni Aru, Miyangolle Ela, Maduru Oya, Pulliyanpota Aru, Kirimechchi Odai, Bodigoda Aru, Mandan Aru, Makarachchi Aru, Mahaweli Ganga, Kantale basin, Palampotta Ara, Pan Oya, Pankulam Aru, Kunchikumban Aru, Pulakutti Aru, Yan Oya, Mee Oya, Ma Oya, Churiyan Aru, Chavar Aru, Paladi Aru, Nay Aru, Kodalikkallu Aru, Per Aru, Pali Aru, Maruthapilly Aru, Toravil Aru, Piramenthal Aru, Netheli Aru, Kanakarayan Aru, Kalavalappu Aru, Akkarayan Aru, Mandekal Aru, Pallavarayankaddu Aru, Pali Aru, Chippi Aru, Parangi Aru, Nay Aru, Aruvi Aru, KalAru, Modaragam Aru, Kala Oya, Moongil Ara, Mi Oya, Madurankuli Aru, Kalagamu Oya Rathambala Oya	20,000	85,000	+ 40,000	+ 25,000
Total			100,000	130,000		

However, these considerations are not of serious consequence to the fundamental philosophy that we propose. Given the differences in the definitions of the zones and the degree of uncertainty of the data, we need not be unduly worried over these discrepancies. The central points of our model are:

I. The total precipitation is equal to the total evapo-respiration plus the run-off to sea. Groundwater recharge is balanced by groundwater extraction.

II. During this passage of water from rainfall to run-off and evapo-transpiration, we would maximise its useful function. We propose to increase the amount of water utilised from the present 10,000 MMC to about 38,000 MMC. The high figure may be explained by our insistence that ecological uses including the maintenance of the water table do form part of the real needs. Some of the water is used more than once before it escapes to the sea.

2 Sources of water

2.1 Water - Production, Consumption and Disposal

When issues concerning water are looked at, the emphasis tends to be on consumption, namely how to allocate water for consumption taking various uses and users into account. But water, like most other naturally occurring resources, has a cyclic existence, in this instance what is known as the hydrological cycle. What is important in any policy dealing with water is to recognise this particular ubiquitous nature of existence of the resource.

Production may be a wrong term in this context but for the policy discussion it means collection (by pumping or under gravity), storage, purification and delivery for consumption (not necessarily pipe-borne). Watershed management and ground water recharge methods could also be taken up under production.

Consumption would entail different patterns that require different quality of water at different times such as in agriculture where it is mainly seasonal whereas in industry it could be continuous depending on the process. The tendency to differentiate between consumptive use and non-consumptive use must be analysed carefully. Generally, consumptive use means water that is not available for any other immediate use due to transfer or pollution. Water used in hydro-electrical power generation is considered non-consumptive but loss of head makes the water not available for agriculture between intake and outlet structures.

In agriculture, apart from the direct use of water in irrigation, there is a large component of transfer in the produce itself that would vary from as high as 70-80% in fresh fruits and vegetable to 25-15% in grains and pulses. This refers only to the water content of the produce itself, but a far higher amount of water (as much as 1000%) is spent in the production process.

Disposal is often a forgotten matter in most policy decisions in most processes such as power generation where effluent and waste are subsumed under environmental issues and as economic externalities. How far this approach is valid in water policy needs to be examined carefully. The possibility of water-reuse in agriculture could be increased by 35% (IWMI) with changes in the pattern of agriculture and system of irrigation. In periurban agriculture conjunctive use of urban wastewater with irrigation water are being tried out in countries such as Pakistan. Water supply is closely connected to drainage and sewerage systems and these aspects of disposal must be integrated into the policy.

Quality and availability

Availability of water is invariable tied to the quality of water, as for example, potable water and water used for flushing toilets in domestic use could vary very much in quality. In the same manner different activities in an industrial processing plant may consume water of varying degrees, some needing special treatment as in a boiler makeup water to prevent scaling. In agriculture the quality of water used in irrigation and in washing the produce could vary.

The per capita daily domestic water consumption in an urban dwelling could be as high as 250 l whereas in a rural setting it could be 50 l. Whereas, overall per capita annual availability of more than 1700 m^3 (4590 l per day) is given as the UN standard for a water-rich country, it is not clear what is meant by availability.

The overall availability does not make much sense as the problem of water shortage is very location and time-of-year specific but the often quoted overall figures in Sri Lanka are: Annual per capita water supply of 2400 m^3; 44% of the total precipitation is available as replenishable water resource after evaporation and infiltration; out of this 75% is runoff to the sea (Ariyabandu). It is claimed that agriculture consumes 90% of water available. How this figure is arrived at is not known and what percentage of reuse is assumed is not stated.

How major irrigation schemes that are called multipurpose, in that they supply water for irrigation and power generation, optimises water issue taking multiple uses is not clear. Whether conjunctive use of rain and irrigation water is possible under these conditions is not clear.

The same consideration in rain- roof-water collection must be built into the design. The type of collector and the quality of water are closely related, and the quality may suffer over time during storage. This will change the use pattern with time from potable to washing etc. Low-cost below ground storage would suffice for non-potable use whereas above ground, covered storage may be required for potable use.

Reuse of water at domestic level is widely practised in water-stressed situations such as using waste water in home gardening, and using three vessels containing water in different stages of purity (or use) while washing plates etc.

Visible and invisible water
We are concerned that all the policy matters are directed toward visible water, either surface or sub-surface, but not what can not be measured and priced. All these are considered losses such as seepage and evaporation. This is akin to the economic stand of measuring what is measurable, and leave out the rest to derive economic policy. The same is found in marketing where only the customer who could pay is counted, not the rest.

How do we incorporate the ubiquitous nature of the "product" we are trying to bring under legislature must be discussed at length. It may then dawn on us that this is one product, like air, that can not be brought under such a policy framework. (Comment: We still need a policy, but not a policy of the type envisaged. We need a policy of encouraging re-use and practices that make it possible, etc., but not a policy for marketing.)

2.2 Domestic water

ur approach to meeting the domestic water requirements may be summarised as follows:

i Water for domestic needs is a fundamental human right.
ii Minimum water requirements are of a similar order and have to be met, irrespective of other considerations such as social class, location (dry zone – wet zone, rural – urban etc.).
iii It is wasteful to use high quality potable water for other domestic uses where lower quality water would suffice.
iv Lower quality water needs may be met more economical using local sources such as roof water harvesting.
v Used water may be recycled within the home to meet certain low quality water requirements.

The minimum per capita water requirements are estimated to be 100 m^3 per annum, made up as follows:

Quality 1	40
Quality 2	30
Quality 3	20
Quality 4	10

Of these, only quality 1 requirements in the urban areas are to be met by centralised large water services. The present infrastructure, if properly maintained, would be sufficient to meet these requirements.

Quality 1 water requirements in the peri-urban and some rural areas may be more economically met by medium scale water services providing pipe-borne water from more decentralised sources. In some of the rural areas, especially in the wet and intermediate zones, they may be met by ground water, provided adequate measures are undertaken to ensure that they are not polluted. Water contamination is most frequently due to improper agricultural practices such as overuse of chemical fertilizer and agro chemicals.

New mechanisms are proposed (see the water balance diagram) to meet the quality 2 and 3 domestic water requirements. A major contribution to meeting these may be made by harvesting roof water, even in most of the dry zone, if adequate storage facilities are provided. Part of it may also be met by ground water, even in the peri-urban areas.

Quality 4 (low quality) water requirements are to be met by rain water harvesting and by ground water. We see the classification of the water requirements into requirements of different qualities of water as a major innovation in meeting the domestic water requirements.

Meeting household water needs is becoming an issue of concern of the peasants in the dry zone. Even though still supply of pipe borne water finds an important place in political manifestos, this is far from reality. The National Water Supplies and Drainage Board is prospecting for new surface and sub-surface water sources to meet urban and peri-urban demand. The cost of producing a unit of water on tap is increasing due to high energy costs, operational overheads, and conveyance losses. These issues have brought pressure to put a price tag on potable water and to bring it under market mechanisms.

Potable water is an essential element to sustain life and hence access to water is seen as an entitlement. This includes water for drinking, cooking, cloth washing, personal washing, toilet use and other domestic needs. Water need identifies needs above entitlement. Per capita water entitlement for South-Asian communities is assessed around 20 – 50 lpcd (Ariyabandu, 2001) where as water need can be as high as 100 – 200 lpcd.

Water entitlement is assessed at household level. The rural communities in the dry zone fulfil their requirement from multiple water sources. Water for drinking is drawn from `drinking wells' in the community; water for other household needs are obtained from wells, nearby irrigation canals and other water sources. During extended dry weather periods, most sources deplete resulting in many hardships.

The factors that contribute towards Household Water Security (HWS) are availability, accessibility and household usage. HWS when quantified in terms of an index is found to vary depending on time of year. HWS is low in the dry zone due to low rainfall. Communities living in certain hill slopes of Badulla and Welimada show a low HWS due to difficulties in carrying water even though significant rainfall is available during most part of the year (Ratnaweera, 2001). Using harvested rainwater at household level can increase HWS; sometimes may meet water requirements beyond water entitlement.

During ancient times, Sri Lanka's irrigation system provided potable water to agricultural communities in the dry zone. The waters of perennial tributaries were dammed at suitable locations to form large reservoirs. These served multi purposes, i.e. as a storage reservoir that supplies water for local irrigation needs and to service smaller tanks. These continuously recharged the groundwater regime and thus domestic wells. Maintaining this sub-surface storage helped cushion against water stresses during extended dry weather periods.

The remnants show once a great hydraulic civilisation, main storage reservoirs serving local needs, through the system of cascading structures. The restoration that commenced during the late colonial era continued to serve communities in the North-Central province. The settlement schemes that began after independence saw re-settlement of farmer communities in Gal-oya, Uda-Walawe and under Mahaweli trans-basin diversion scheme. These waters nourished soil water while serving community needs.

Regions that did not receive irrigation waters were provided with deep bore wells, which are now hardly usable. Continuous exploitation of groundwater resources in Hambantota District has made it vulnerable during extended dry weather periods. This was evident during the recent drought where certain communities received potable water transported using bowsers.

The state, having recognised the non-viability of providing pipe borne water to these communities encouraged NWSDB to look for alternate means. The Community Water Supply and Sanitation Project (CWSSP), funded by the World Bank, promoted collection of rainwater at domestic level. The promotion of the 5 cubic meter tank made of Ferro-cement, and the brick tank with the same capacity was connected to roof catchments. These were installed in houses in the Badulla district. This work was continued by Lanka Rainwater Harvesting Forum (LRHF) a non-governmental organisation. It promoted the technology in the dry zone, involving in training skilled personnel in tank construction, constructing tanks in schools and houses, measuring water quality and carrying out socio-economic surveys to ascertain effectiveness of this technological intervention. LRHF is also lobbying towards obtaining recognition for DRWH in the National Water Resources Policy. DRWH is observed to enhance HWS even though user surveys have revealed many operational issues. DRWH requires periodic maintenance to ensure water quality. Clean water obtained after the first flush, filtered through a sand filter while preventing contamination during extraction can be used for a longer period. Some households have used this to supplement their home gardening needs.

The state policy in the past has been to provide relief to maintain livelihood in such areas. The lack of a coherent policy to develop groundwater resources in such regions is a result of giving priority to economic efficiency while down playing agricultural growth and ecological balance. The state's attempts to promote industrial development in Hambantota District failed due to lack of quality water for industrial processing needs.

The National Water Resource Policy and Institutional Arrangements and the setting up of the Water Resources Council (WRC, 2000) was approved by the Cabinet of Ministers in April 2000. The policy notionally acknowledges the need for state ownership; stakeholder participation in water resource management; water rights and equity; information sharing for sustainable water use; and to recognise irrigation sector needs.

WRC (2000) gives priority to irrigation needs over domestic or any other need. Its justification is based on:

i Past emphasis in developing water resources primarily for agricultural use and

ii Concerns with regard to return on investment made on irrigation related infrastructure development.

Sri Lanka expects (according to the PRSP and 'Regaining Sri Lanka') a significant increase in urbanisation even in the dry zone, which requires pipe borne water to meet their water needs. The total urbanisation is estimated at 60 per cent in year 2025; a 30 per cent increase. This has been shown to be a misguided policy and has been repeatedly rejected by the electorate.

The policy should encompass all stakeholders in order to avoid a conflict between strong and powerful urban dwellers and the rural poor. It needs to give direction towards formulating regulations on urban water conservation through groundwater recharge and by promoting rainwater harvesting, enforceable by 2025. These strategies may facilitate agricultural and ecological developments to take place in the rural dry zone.

It has been shown by Sriyananda (2001) and Fernando (2001) that the policy failed in its implementation due to lack of participatory approach. Managing water resources is essential to ensure water needs of the dry zone. HWS maintained by a community over a hydrologic cycle decides its potential to contribute to economic development. The country's failure to take a participatory approach and to encompass water sector needs in their policy implementation strategies had a significant effect in their failure. .

The country's National Water Resource Policy is influenced largely by the policies of the incumbent government, the two schools of thought being:

i. Water is a community owned resource; it is considered more a social good; emphasis on irrigation needs; distribution regulated by state owned body.

ii. Water is a community owned resource; it is considered an economic good, hence the level of service to consumers can be improved with full cost recovery; distribution with private sector participation.

The state in its bid to meet structural changes imposed by international lending agencies put forward a Bill to allow private sector participation in water and waste water services in urban and rural Sri Lanka. The Water Services Reform Bill gazetted in October 2003 proposed to regulate and monitor provision of water services and to regulate associated tariffs. This was the outcome of the State's Water Management Policy Statement (WMPS, 2002) and Poverty Reduction Strategy Paper (PRSP, 2002), which was later incorporated in to Regaining Sri Lanka (2003?), the state policy document for development.

The Bill grants operational rights of public water sources to service providers thereby restricting public access to protect surface and ground water bodies, their catchments from possible contamination. This is in violation of the right to access both water entitlement and need of human beings and animals; and for agriculture (around 85% of the total use). The Bill stipulates a two fold increase in urban water needs within a few years. The service providers are required to maintain a high level of service in terms of quantity, quality and access. Such high services levels come with high production costs which high overheads, not to mention how market mechanisms makes consumers defenceless against consequent exploitation.

The Water Services Reform Bill (2003) is supportive of the agreement reached at the 3rd World Water Forum in Kyoto; March, 2003. It recognises the need to consider water also as an economic good; with an economic value that is determined by market price mechanisms in accordance to the full cost recovery principle.

The proposals stipulated, however, seem to violate right to water as enunciated by the United Nations Economic and Social council in its General Comment No. 15 of 26th November 2002. General Comment No. 15 acknowledges that *"… the human right to water is essential to conduct his own existence with dignity and it constitutes a pre-condition to realization of other human rights".* It also states that *"water should be treated as a social and cultural good, and not primarily as an economic good. The manner of the realization of the right to water must also be sustainable, ensuring that the right can be realised for present and future generations".*

The General Comment No. 15 acknowledges both human water entitlement and water need; where as the agreement reached at Kyoto stipulates that this right is subjected to market mechanisms. Past experiences have shown us that market mechanisms go beyond good old supply – demand; market players, the playing field and market tactics have lead to marginalisation of minority shareholders; in the dry zone this means a population with a majority with a per capita income of less than US $1.

The Water Services Reform Bill (2003) intends to regulate tariffs through a regulatory body. Such regulatory bodies have very little control over price escalations due to operational and infrastructure investment costs. This is evident in telecommunication services and LP (cooking) gas where prices escalate even with state subsidies and lifting of state levies.

The said Bill allows the regulatory body to withdraw the license in the case of failure to provide the necessary service. It also is empowered to handover the service to another service provider operating in the country or to NWS&DB. Case studies from the developing world show that such interventions results from the inability of the service provider to deliver at least the water entitlement at an affordable price. This also raises the issue whether another service provider could take over to ensure an uninterrupted service. Perhaps one wonders whether the (then) down-sized state water utility could crisis manage the situation.

The proposed Bill does not encourage stakeholder participation; the State has detached its self from being a stakeholder, but retained its role as a guardian; the State regulatory body expected to play the ombudsman's role. Many examples from the third world have taught us that revivifying a natural resource without subjecting it to further exploitation requires agreement and active participation of all stake-holders. A national policy in this regard would frame how household water entitlements and needs can be achieved while considering water as a social and an economic good.

Ancient wisdom has taught us the need for sustainable water use and the need to coexist with the natural hydrologic cycle. The use of multi-sources to fulfil water needs especially during extended dry weather periods have ensured that water remained community owned property. Changes that have taken place over the past three decades have made use of natural systems unsustainable. Today we are faced with the issue whether we should revive the natural habitat through favourable interventions or continue with economic development through exploitation of life giving non-renewable resources.

2.3 Water and agriculture

In the context of Sri Lanka, when we discuss water issues in agriculture, there are two separate substantive issues to be considered:

i. Water for agriculture (Dry zone agriculture and wet zone agriculture)
ii. Impact of agricultural practices on water quality (pollution due to agriculture)

2.3.1 Water for agriculture - Dry zone agriculture

Agriculture in the dry zone is currently perceived as being almost 100% based on irrigation, but this has not been the case historically. In our model, we have allowed for rain-fed agriculture, especially during the Maha season. But this is possible only under special circumstances. Agricultural growth and ecological efficiency require long-term interventions. These involve effective recharge through water retention and infiltration and growth of local species to increase plant cover. Such changes have been successfully implemented in local catchments (e.g. Auroville, State of Tamil Nadu, India) and such experiences in the Indian sub-continent are available. These interventions can be made effective through stakeholder participation and ownership, complemented by a National Water Resources Policy. We need to re-visit the ancient practices of soil and water conservation in the light of modern experiences. The philosophy of looking at agriculture as a factory production process with specified inputs (including water) and outputs has failed, and a new (meaning ancient) perspective is necessary.

2.3.2 Water for agriculture - Wet Zone - Water conservation and catchment management

As was already mentioned in relation to dry zone agriculture, we need to learn from the experiences of other countries:

India: [Namoodiri 1999]

The benefit / cost ratio of irrigated agriculture in India are questionable. Some of the salient points are:

- The capital investment in irrigated agriculture varies between Rs. 30,000 to 60,000 per hectare. Whereas, improved dry land farming followed by heavy soil and water conservation practices would need only about Rs. 3,000 to 7,000 per hectare as initial investment
- The annual cultivation cost under irrigated conditions including running and maintenance cost of irrigated systems and other cultivation cost works out be around Rs. 20,000 per hectare for perennial crops. Whereas, in dry land farming the cultivation cost seldom exceeds Rs. 3,000 per hectare.
- The highest net income from irrigated agriculture is about Rs. 30,000 per hectare under the presently subsidized power tariff and irrigation tax. Whereas, under dry land horticulture one

can get a net annual income as high as Rs. 30,000 per hectare from Indian Gooseberry, and even much higher income if timber trees such as teak and mahogany are introduced.

- The water utilization efficiency of irrigated agriculture, except in lift irrigation using pipe conveyance, is much lower (25%) compared to rain-fed farming (50%). Besides, the water utilization efficiency of rain-fed agriculture can be increased to as high as 80% by highly economical and simple means such as mulching etc. whereas in order to increase the water efficiency of irrigation systems one has to spend huge sums for pipelines, lining of canals etc.

Water management in the wet zone will take increasing importance as irrigated land in the dry zone is limited and most small farms that produce vegetables are in the wet zone. The major export crop i.e. tea, is grown in the high and mid altitude solely dependent on seasonal rain. Therefore, water management in the wet zone would become very crucial in the future.

Water use in farming

The wet zone water use in agriculture is seen vividly in tea plantations, terraced paddy fields and Kandyan forest gardens.

The tea bush while reducing the erosivity by acting as a physical barrier, promotes erodibility by funneling the water that falls on the land. The methods adopted traditionally such as contour drains and stone terracing are being replaced with vegetative barriers planted on the contours such as gliricidia.

The terraced paddy fields, on the other hand, slow down the flow down a slope by regulating the flow held in small ponds created in the liyaddas. During the off seasons the same land formations are being used to cultivate vegetables that require less water.

Water for farming is also obtained by building pathaha, a shallow depression in the ground to store water, to cultivate crops such as potatoes.

The traditional home gardens tend to have several canopies with a ground cover crop to prevent surface water drainage promoting soil and water conservation. The home gardens that produced a variety of spices and other produce such as areca nuts are being replaced with intensive vegetable cultivation.

Constant ground cover is a must to prevent erosion in the wet zone where most of the activities take place in farms and plantations established on sloping land. Tree crops are a better form than short rotation crops such as seasonal vegetables that need ground preparation and replanting. Rubber as a plantation crop with live mulch has been proved to be a good method of conserving and recharging ground water.

The new plantation crop Gliricidia introduced as a soil fertility supplement and to meet fodder/fuel needs of the rural people, is also a practical approach to conserve water by preventing surface runoff and retaining water in the soil.

Due to extensive use of chemicals in all the new forms of agriculture the surface water that was available for bathing and other general uses has become too polluted for such use. Resorting to reduced chemical use and gradually turning farming into organic forms of agriculture will be necessary to answer the problem.

Watershed management

The hills in the wet zone are considered as the watershed area for the massive reservoirs that were built to supply power to the urban areas and water to the dry zone. Up steam of the reservoirs are kept as reservations for watershed and trees are grown to promote water retention. The species grown as pioneer plantations on hill tops tend to deplete ground water resources thus making the water availability to the people inadequate. The cyclic filling up and emptying of the reservoirs tends to promote ground water movement thus affecting the wells that are supplied by ground water lenses.

Despite the attempts to manage water sheds in the vicinity of the reservoirs, the silting of the reservoirs is observed due to soil erosion taking place in the upper reaches where tea and vegetable

crops are grown. It is imperative that measures are taken to prevent soil erosion so that the full capacities of the reservoirs are made use of.

While recharging of ground water and promoting soil infiltration by planting tree crops care must be taken to secure the safety of people against land slides in the hilly areas. The trees are known to prevent surface flow that causes erosion leading to gully erosion and land slides. But in the earth-slip prone areas, infiltration also could promote movement of soil through creating fluid conditions for sliding of earth. The two contrasting situations must be studied in detail when water conservation through watershed management is planned.

2.3.3 Impact of agricultural practices on water quality

When water issues are discussed, quality of surface and ground water is closely linked to availability. Apart from industrial processes that pollute ground water mainly in the urban surroundings, a bigger problem faced in the rural sector is the type of 'modern' intensive farming practices that need chemical fertilizers to improve soil fertility, and pesticides and weedicides for crop protection.

In the past, a more benign form of agriculture that relied more on on-farm resources was practiced that did not create acute problems of water pollution. Sustainable agricultural systems described by Edward *et al* in 1990, describes the system as low-input farming that "seek to optimise the management and use of internal production inputs and to minimise the use of external inputs such as fertilizer and pesticides, wherever and whenever possible, to lower the costs, to avoid pollution of surface and ground water, to reduce pesticide residues in food, to reduce farmers' overall risk, and to increase both short and long term profitability."

Such farming systems by nature had to remain small with individual attention paid to all aspects of farming, especially management of pests. The method also required mixed cropping to promote a better balance of prey-predator control that was a natural process that needed minimum external intervention.

The modern system relied heavily on specialised farming of mono crops on a continuous basis on the premise of economies of a scale. The belief is anything bigger is better because of economies of scale and as you get bigger everything could be carefully and formally coordinated.

The entire process of control, akin to industrial process control, has the characteristic of denaturing the natural processes such as clearing the field of everything other than what you want to grow, apply water and chemicals to optimise yield and consider drainage and pollution as external factors. If the farm becomes unproductive move on to another area, the same way industries are relocated when costs go up.

The external costs borne by the State could be very high as indicated in the UK in 1996 [Pretty, 1996]

	Cost of corrective measure in Million £
Pesticides in water	120
Nitrates in water	16
Phosphates in water	55
Cryptosporidium	23
Damage to wild life	124
Damage from gas emissions	1113
Loss of organic matter from soil	96
Food poisoning	169
BSE	607

Sri Lanka's situation

A study done in Sri Lanka by Dr. J.M.R.S. Bandara has quoted several findings that indicate a high presence of chemical residues in the water bodies, especially in the paddy growing areas.

The study reports high nitrate and phosphate contents in Parakrama Samudraya and that this water is used for drinking purposes. The excessive use of nitrogen and pollution due to leaching in Kalpitiya has been detected and phyto-remediation practices are implemented in some areas.

Dasanayake et al did a study on the presence of heavy metals in irrigation tanks in the North Central Province, in 2005. The five tanks studied were Kumbichchankulama, Alankulama, Thuruwila, Karapikkada, and Ulukkulama.

A set of six samples of water, Nelum rhizomes, soil from the bottom and soil from the periphery were collected at each site.

Metal	WHO std	Kum.	Alan.	Thuru.	Kara.	Uluk.
Cd	.003	.051	.04	.057	.056	.032
Co	NA	.222	.143	.038	.145	.142
Cr	.05	-	-	-	-	-
Cu	1.0	.023	.024	.025	.015	.017
Fe	.30	.203	.793	.47	.63	1.277
Mn	.05	-	.181	-	-	-
Pb	.01	.03	.006	.022	.032	-
Zn	2.0	.10	.099	.065	.106	.099

It has been reported by Athuraliya *et al* in 2003, that chronic renal disease (CRD) not associated with diabetes and hyper tension was very common in the North Central Province.

It is also reported that Nelum rhizome extracts heavy metals from water and store these. The study suggests that growing lotus is an ideal phyto-remediation method that would have been used in the past. Consuming the rhizome is not encouraged as a result.

What are the alternatives?

One possible alternative suggested by Mr. G.K. Upawansa is Nawa Kekulama in paddy cultivation. This is a timely cultivation practice that harmonises water use and agronomy based on traditional knowledge of the agro-climatic zone. The main benefits are:

Soil conservation due to low tillage of the soil
Conservation of soil organic matter by mulching
Conservation of water by alternate weed control method rather than flooding
Conservation of nitrates and prevent leaching by slow denitrification
Use low input of external fertilizer
Pesticide application replaced by biological control
Low cost of production that offsets a slight drop in production

A comparison of the costs incurred in a trial done at Aralaganwila in 2001 is given below to compare the difference in yield and income.

Activity/ Cost per acre in Rupees	"Modern"	"Kekulama"
Weedicide (*Paraquat*)	1,400	-
First ploughing	2,000	2,000
Second ploughing	1,600	1,600
Third ploughing	1,600	-
Seed bed preparation	2,500	2,000
Straw mulching	-	500
Compost	-	350
Neem seeds	-	150
Basal fertilizer	1,570	-
Weedicide *(Nomini*)	990	-
1st top-dressing urea	350	-
Insecticide	1,200	-
2nd top-dressing TDM	1,400	-
Harvest and handling	2,000	2,000
Total	16,610	7,600

Method	Cost per acre Rs.	Yield in kg	Income @ Rs. 12 /kg	Profit/acre	Water use efficiency m^3 per g
Nawa Kekulama	7,600	1,877	22,524	14,924	2.4
"Modern" Farmini	16,610	2,258	27, 096	10,486	5.2

In the years 2003 to 2005 a series of trials were done in Huruluwewa to study water use in Nawa Kekulama. Mr. Upawansa reports that the water required per ha in Kekulama was 15,000 m^3 compared to 73,800 m^3 in modern farming. The amount of water used per g of dry matter produced is from that study. These figures indicate a higher dry-matter production under the traditional system but not necessarily higher yield of paddy. This is of importance in the case of Nawa Kekulama as the present varieties of paddy do not produce sufficient straw to cover the fields as mulch that is required in Nawa Kekulama.

Changes in policy

A direct counter argument would be that such a policy change in shifting from 'modern' high yielding methods to low yielding methods may produce food scarcity despite the farmers getting a better net income. Though the initial period indicated a drop in yield the long-term trials done at Rodale Institute in USA has shown over four years the yields exceed that of 'Modern' farming. Further, the indirect costs of "modern' farming, as indicated in the British study must be done in Sri Lanka, to arrive at a decision on the effect on water quality, cost of mitigation, of ill-health and of loss of production due to morbidity.

The direct policy changes bearing on water would be how water issue for irrigation is managed to suit local needs. If large irrigation requirements are met from distant dams the timing of issue to suit specific needs may pose problems. Further, local system of water management and agronomy practice on a collective basis may be required to change over to Nawa Kekulama as it requires collective decision making on when and how to farm.

The present irrigation waters may not be suitable for Nawa Kekulama as it may carry an excessive load of chemicals which may not be conducive for natural regenerative processes based on natural biological activities. Especially, if reuse of water is envisaged a collective of farmers must decide on the system they would adopt as otherwise the method may not work.

The change over maybe promoted by reducing the subsidy on urea and giving an incentive to the farmers to change over in the initial period. The incentive could cease after four years once the yields are stabilised and organic matter in the soil is restored.

Constraints

The powerful traders in fertilizer and chemicals would oppose such moves and the economists may support the view that ecological farming would result in higher food imports to off set the initial drop in production.

If a complete environmental cost of chemical farming cannot be carried out due to lack of data and initiative, at least the cost of imports of chemicals that could be saved could be assessed and compared with the 'predicted' food imports.

If farmer poverty is to be addressed, instead of subsidising foreign suppliers of chemical inputs the farmers could be subsidised directly for adopting low-input farming and for growing soil-enriching and water conserving vegetation such as gliricidia that will meet both fertility, fodder and fuel needs of the poor.

2.4 Water for industry

Our model requires large-scale reuse of water by industry.

For the purpose of water use and water allocation, we may classify industry into different categories as follows:

- Service industries
  - Hospitals, school etc,
  - Restaurants and similar services
  - Hydropower generation
  - Others services such as thermal power generation
  - Tourism and similar services
- Production industries
  - Food industry
  - Other industries

Where public health is directly involved (hospitals, restaurants, food industry etc.), there will be a requirement for quality 1 water, the meeting of which requirement is a public obligation. However, even in these cases, the industry must be required to put into practice re-use mechanisms to recover water for subsidiary uses.

The following quotation from the [Impelluso and Pfafflin] refers to the economics of reuse:

> Water reuse is an art as well as a science. The processes presented here are commonly used in preparation of wastewater for immediate reuse. However, the particular situation under study must dictate the economics of reuse. The ultimate level of reuse is the dominant factor in deciding if reuse is practical.

The economics of course depends on the environment in which the industry works. In Sri Lanka at present, there is hardly any incentive for an industry to reuse water, and this has to change. Impelluso and Pfafflin have also reproduced extracts from the Guidelines for Water Reuse [EPA], applicable in the US (highlighting introduced):

Type of reuse	Applications
Urban public access (unrestricted)	Parks, playgrounds, schoolyards, and residences; toilet flushing, air conditioning, fire protection, construction, fountains, and ponds.
Urban public access (controlled)	Irrigation needs of golf courses, cemeteries, and highway medians.
Agriculture (food crops)	Irrigation needs of food crops. The type of reuse water is further classified as water for food crops consumed raw or processed.
Agriculture (non-food crops)	Irrigation needs for crops used as fodder, fiber, and seed crops, pastureland, commercial nurseries, and sod farms.
Recreation (No restriction)	Recreational activities with no imposed restriction on body-contact.
Recreation (restricted)	Non-contact recreational activities such as fishing, boating.
Environmental uses	To create wetlands, enhance natural wetlands and to maintain or enhance stream flows.
Industrial uses	**Used in industrial facilities primarily for cooling system makeup water, boiler feed water, process water and washdown.**
Groundwater recharge	Used in infiltration basins, percolation ponds, or injection wells to recharge aquifers.
Indirect potable reuse	Intentional discharge of highly treated reclaimed water into surface waters or groundwater that are or will be used as a source of potable water.

Note that in production industries, water reuse for most of the important industrial uses is possible under favourable conditions.

3 Advocacy

It has been argued [Kulatunga 2006] that the process of 'water reform' can be modelled as a seven-stage process, and the place of most communities and countries can be located on this model. Sri Lanka was said to be in stage 2 in this process. The seven stages are:

viii Initial stage, when municipalities (and sometimes countries and their governments) are lobbied, cajoled and threatened by various parties (the international "donor" or lending agencies such as the World Bank and the IMF, national agencies of exploiting countries such as the DFID of the UK and GTZ of Germany, the big multinational water companies such as Vivendi and Suez, and local groups funded by these agencies or expecting to profit from their involvement) to follow the path of "reform".

ix The period of mass action by the people and their organisations against the handing over water resources and their control to multinational companies.

x The third stage, of actual handing over of control.

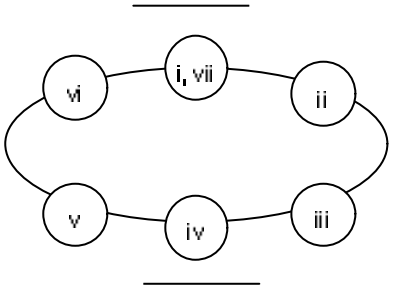
xi The next stage, when the consequences become unbearable and the people start revolting against the "reforms" and demand their dismantling.

xii The next stage when the reforms are overturned, usually along with the governments that introduced them.

xiii The stage of legal action by the companies, trying to reassert their influence, with the help of their original sponsors, the International Monitory Institutions and the World Trade Organisation.

xiv The final stage of settlement.

However, we need to note a much more significant fact about this model: that all communities finally approach stage 7 which is identical with stage 1, that is, where they started off with. This is illustrated in the figure:



In the case of Uruguay, it is the result of a constitutional amendment, backed by a referendum.

We propose that this is the path that Sri Lanka should take. It will help us to get over the debilitating debate and get on with the tast of real water reform.

What are these necessary reforms? They emanate from the discussion so far, and may be summarised as follows:

Reforms

New building regulations to ensure that roof water is collected and used for flushing toilets, home gardening etc. in new constructions in urban areas.

Subsidies, linked to undertaking to reduce consumption of pipe-borne water, for existing buildings to be modified for using roof-water for flushing toilets.

In all suitable locations, encourage the return of used water direct to the ground, rather than into the storm water system, after necessary purification.

Encourage use of ground water to supplement roof water where necessary.

Regulations regarding the discharge of industrial pollutants to waterways to be updated

Technical assistance in meeting such regulations to be provided to industrialists by the CEA and the water Board

In the dry zone, traditional small tanks should be restored and maintained by the Department of Irrigation, as a means of maintaining the water table.

Redesign all existing irrigation schemes to accommodate re-use of irrigation water

Concrete lining of canals should be stopped immediately

Forest Department to undertake an extensive scheme of community forestry to re-forest all degraded forestlands, including shrub lands

Uneconomic tea plantations (definition: plantations which cannot afford to pay a living wage of say Rs 200 / day, to its labour force and still remain profitable) to be converted to home gardens (simulated forests) as a means of improving retentivity of water in the soil and of improving the living conditions of the workers

Recognise a long-term objective of moving away from chemical based agriculture to organic agriculture.

Provide technical assistance and financial incentives to farmers / estate management to migrate to organic agriculture.

A systematic land use study to be undertaken to determine agricultural crops and practices conducive to water conservation, while meeting the food and other requirements of the people.

Decentralised participatory water management practices to be identified and put into practice as appropriate for each locality.

A cost / benefit analysis of the above proposals should be carried out as part of the study. Costs are, in most cases, fairly obvious, even though they have to be calculated. Benefits are not so obvious, and will included increased availability of water and consequent reduced costs of provision, improved health and consequent saving in health-care costs, increase availability of timber and fuel wood, etc.

References

Ariyabandu, R de S and Aheeyor, M M M: Secure water through demand responsive approaches – The Sri Lanka experience, Overseas Development Institute, 2004

Ariyabandu, R. de S., `Household water security using rainwater harvesting', Domestic Rainwater Harvesting Workshop, IIT – Delhi, April 2001.

David Hall, Emanuele Lobina and Robin De La Motte , 'Making Water Privatisation Illegal: New Laws In Netherlands And Uruguay, Public Services International, 31 November 2004.

Fernando, Sarath 2001: "Can water marketing prevent a crisis", Movement for National Land and Agricultural Reform.

Guidelines for water reuse EPA 625/R92-004, US Environmental Protection Agency, Washington, D.C., 1992.

Impelluso, Anthony and Pfafflin, James R. ,' Water Reuse' in Delyannis, E., Desalination, Encyclopaedia of Science and Engineering, 3rd edition, Vol 1, Gordon and Breach, New York, 1991.

Kulatunga, Gamini, 'Implications of recently proposed water policies on the marginalised', A study carried out for Practical Action, March 2006

Namoodiri, K.M. , "Watershed Development: A Sustainable Solution to Drought" Auroville, 1999

Pretty, Jules - "The real costs of modern farming" University of Essex, England, 1996.

Ratnaweera, H. G. P. A., `Modelling Water Security', Domestic Rainwater Harvesting Workshop, IIT – Delhi, April 2001.

Sriyananda, H. 2001: 'Water water everywhere, but not a drop to drink; pricing the priceless water – impact on society', Engineer, Vol. XXXIV, No. 02, pp 88 - 91

The National Atlas of Sri Lanka, Survey Department, 1988.

The Intermediate Technology Development Group was founded almost forty years ago in Britain by economist E F Schumacher, author of 'Small is Beautiful'. Today the organization has widened its reach and has offices in seven countries-Bangladesh, Kenya, Nepal, Peru, Sri Lanka and Zimbabwe-across the globe. The new working name of Intermediate Technology Development Group is Practical Action.

With a vision to make this world free of poverty and injustice in which technology is used to the benefit of all, Practical Action (ITDG) has a unique approach to development. We don't start with technology, but with people. The tools may be simple or sophisticated, but to provide long-term, appropriate and practical answers, they must be firmly in the hands of local people: people who shape technology and control it for themselves.

Practical Action (ITDG) believes that the right idea, however small can change lives. It can create jobs, improve health and livelihoods, and help people have better lives. That's why, since 1966, the organization has been working with poor people to develop the skills and technology that will enable them to build a better future.

PRACTICAL ACTION
Intermediate Technology Development Group

PRACTICAL ACTION (ITDG) - South Asia Programme
5, Lionel Edirisinghe Mawatha, Colombo 5
T | (011)2829412 **F** | (011) 2856188 **E** | srilanka@practicalaction.org.lk
W | www.janathakshan.org www.practicalaction.org