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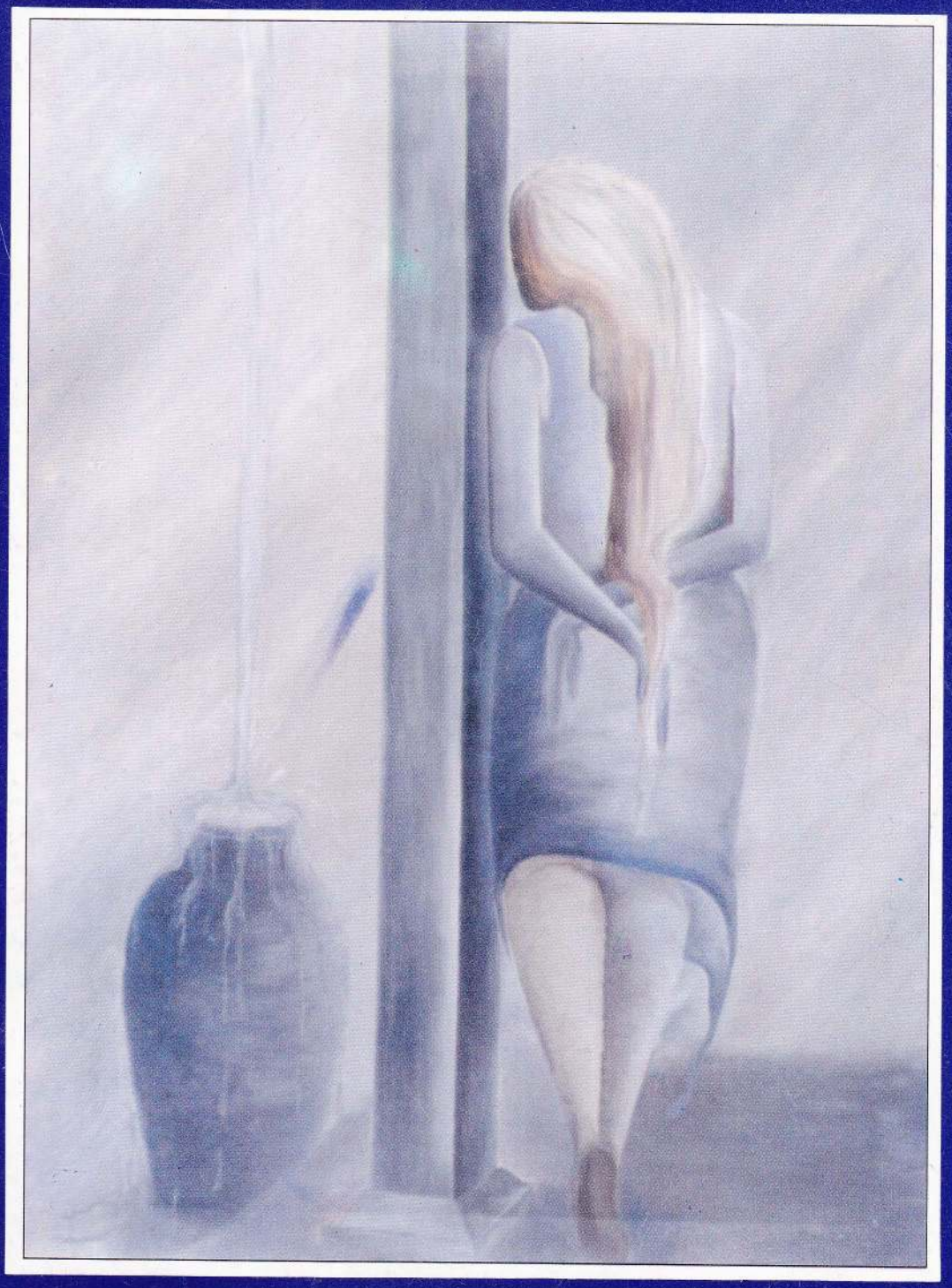

WATER PRECIOUS

Contents

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Editorial

The importance of water is daily rising with the growing shortages caused by environmental factors and the increasing demand the world over. In this journal we have highlighted some of the natural causes which reduced the supply of water and the dependence of human and other existence on water. We have also given a brief account of water management in the past as well as some plans to meet the demand in the present and the future.

Rural women are more affected than others when periods of drought appear. They have to trek miles in search of water. Women need and use more water than men. They need water for the family while others need it for personal use.

In an article titled The State of the Earth Published in the Sunday Age, John Vidal says "Water will become the most pressing environmental issue of this century". He adds "Global consumption of fresh water is doubling every twenty years and new sources are becoming scarce and more expensive to develop and treat.

"Some 70 percent of all the worlds' fresh water used by man goes to grow food and in parts of the US, North Africa and Asia farmers can take up to 95 percent"

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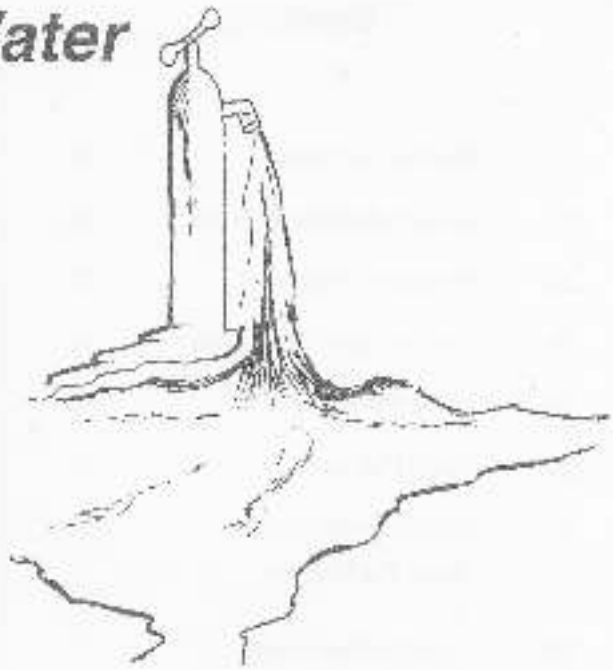
Why we took up the issue of water in a women's journal is because women are the first victims of water shortage. In the future, she will not only give more valuable time to procure it for the family, also labour and stress under its growing difficulties.

The rural women's trek in search of water during periods of drought which we witness even today in the South, East and part of the Western coast line will increase as the crops she will squeeze out of the sand will decrease.

We need to cry loud about this fact and start taking preventive measures. This does not mean that we take the road to commercialization of water. Water is by birth a right and so is fresh air. Do not bottle them.

Eva Ranaweera

Women and Water



Vijita Fernando

Water is a woman's issue. In the rural areas of Sri Lanka as in other parts of South Asia, the responsibility for water transport and the operation and maintenance of traditional water supply systems lie entirely with women. Water is also one of the main priorities for women due to its importance for family health and welfare.

Women are also the first victims of water scarcity. It is they who suffer the extra burden when water systems fail to function. Water is one of the greatest users of women's time, spending as she does almost a quarter of her working day on tasks related to water.

This leaves many women in a truly ironic situation - **their's is the vital role in water in the home and the community, but they have little or no choice in the setting up and functioning of water systems. To use a cliche - they remain the fetchers and carriers of water.**

Roles and Realities

It is also a user of her energy, leaving little for her other numerous tasks. Despite this reality, poor rural women have been the bit players in the water scenario, with little access to better tools and techniques and less information on their use.

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A rural woman's mobility and participation are also generally hampered by traditional and cultural constraints. Thus women's need tend to be neglected in project planning, also as a result of the mainly male planners' limited understanding of the women's roles and responsibilities. Traditional knowledge and management skills are almost always unrecognized with the result that a woman's position is weakened rather than strengthened by external projects.

It takes very little to realise that a woman's traditional roles of managing water systems and supply in the home should logically extend to women setting up useful and functioning water systems. When new water systems are built without knowledge and acknowledgment of this traditional role, women's tasks in public management of water are limited to physical work. Women keep standposts and drains clean, report problems about handpumps and so on. But they do not have recognized status or authority and are often in a subordinate position, having little or no voice in a matter so vital to the welfare of their families.

But there are silver linings - more so in the last decade, by the end of the UN Drinking Water and Sanitation Decade in 1990. Pioneering international efforts by many men and women have provided major breakthroughs in achieving the involvement of women as part of mainstream concerns, including designing and learning environment, achieving sustainable and effectively used water systems through replaceable methods and developing a framework of technical and social interventions acceptable to technicians, managers and to gender specialists. All this meant that at the end of the UN Decade for Water, women began to emerge not as a special interest group in water and sanitation, but as a mainstream group - as partners and with reduced burdens.

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Over the years it has also emerged that though the role of the women in water management is primarily one of providing and using water at the household and community level, a woman's contribution is not necessarily limited exclusively to these narrow concerns.

Women are also beginning to have important roles as decision makers, planners, managers and research scientists in making water resource development and management possible. Though women's current and Potential contribution in these major areas has been largely neglected, they are no longer the pipe dreams they were a mere two decades ago.

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Many Sri Lankan NGOs are placing a strong emphasis on gender in their programmes and evolving individual gender orientations. Though these differ from one organization to another, as a

whole it means that it is realized that women and men must be equitably involved if a project is to be successful and sustainable. They are also aware of the cultural and historical context and the value systems of the society they are working in and that gender perceptions must be in tune with these.

Nowhere is this approach more pertinent than in water projects. For women to be successful in any development project - including water - several broad issues relating to the situation of women in the country vis-a-vis the men must be taken into serious account.

Despite the success achieved by Sri Lankan educated professional women, despite free education and the high literacy rate for women in this country, the sad truth is that women in general occupy positions subordinate to men. Thus one of the first prerequisites is that women in general, and women in remote rural areas especially and in semi urban slum and shanty dwellings have to be brought into the mainstream of development. Hand in hand with this must be policies that satisfy the strategic needs of women, not only their practical needs. Democratic decision making processes in matters relating to both men and woman need to be institutionalized.

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Many projects have shown that it is counter productive to mobilise only women. The NGO Water and Sanitation Decade Service, the only NGO in the country devoted to water and sanitation, is a consortium of 35 NGOs. Projects in rural areas, mainly as a partner in the Community Water Supply and Sanitation Programme (CWSSP) of the Ministry of Housing, has tried in all their rural based projects to promote a gender balanced approach through training. Gender awareness programmes have preceded the provision of water and sanitation with the Decade Service playing an advocacy role. The gender awareness programmes were also at a national level, aimed at men and women who would introduce such programmes in their projects and, much more successfully, at grass roots level, away from air conditioned conference rooms and magi boards to actual beneficiaries - mainly poor rural women.

The Decade Service has many interesting tit bits about these programmes. The reluctance of men at first was broken down quite fast and at the beginning of the second day's programme in a village in the Ratnapura district, there was a gender balance of men and women. At another, the men were young, on the brink of marriage and they confessed afterwards that quite apart from water projects they learnt that they should be partners in the work load of their households and not leave everything to their prospective wives!

Cultural and traditional constraints came to the fore when a retired principal of the village school, a respected figure in the village, confessed that though he was quite aware of the importance of a gender approach, how could he advocate such an approach to the villagers, what would they think! A man in his position should not express publicly that men and women were equal and that women could do things as well as men, or even better!

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In almost all our water programmes at village level, it has been found that the equal participation of women always enhances the project. In Sri Lanka in the past few decades there have been extremely successful social mobilisation programmes in poverty alleviation, in rural banking, in volunteer health programmes which have exposed many rural women to new concepts. Their involvement in these have made them open to the fulfilment of strategic needs, the concept of gender and the potential for women as leaders. Developing leadership roles among women often leads to the development of the community in which they live and to the development of the NGO itself.

At least some of our partner organizations based at rural level (Community Based Organizations (CBOs) have achieved progress in a gender approach in water projects. To achieve a more comprehensive gender approach, there are several key elements that could be tried.

- Ensuring that at least half the number involved in a project are women at all stages of the project from planning to final evaluation - which will ensure an impact on long term sustainability.

* Supporting gender sensitization and balancing by developing case studies of successful experiences from countries with similar situations as in Sri Lanka.

* Taking the long term view that introducing a gender approach can address women's strategic needs which can, over time, improve the situation of women, and not merely a practical one which seeks to improve the present condition of women by providing water close to their homes.

* Compiling the experiences of NGOs to help formulate policy guidelines to support gender balanced development in future programmes.

A number of international meetings in recent years have analysed the current and potential roles in sustainable water resource management and provided a forum to review experiences objectively to draw practical and operational lessons. Most of these views and findings are relevant to our own experience in Sri Lanka. At least some of these conferences came up strongly with the view that the situation of women cannot be improved in the foreseeable future by making statements at international conferences in support of women's involvement. There should be a platform for action, they agreed.

To increase the participation of women in balance with the participation of men, communication, training, education, transfer of information and interdisciplinary teams which could contribute to integrate water development are fundamental.

The non governmental community has a vital role to involve the overall population in water resource development programmes.

There is an additional aspect that needs consideration - the situation of women without men. This is specially crucial in our context where daily women are forced to take new responsibilities with men migrating, dying in the war resulting in the emergence of single parent families, headed by women. These situations create new roles for women as administrators and producers, managers and users. It is imperative that women get the necessary technical training to plan and manage water supplies and facilities by themselves.

In our own context we have to face the truth that despite many women making their mark in the economy and the professions, women are barely in the seats of power, and are invisible in the water sector. Sri Lanka has never had a woman Minister, not even a **Secretary in a line Ministry,** nor as head or anywhere near the top in the National Water Supply and Drainage Board - the main agency for water in the government. **There is not a single woman in the Water Resources Council nor in the Water Resources Secretariat or in the Community Water Supply and Sanitation programme (CWSSP). We also do not have any disaggregated data on women in the water sector.**

There are certain aspects that should be considered when working with women in rural situations. Women are not a homogeneous group. Caste and class differences may exist and should be taken into account. Women's involvement should be more than a labour contribution. It also means access to resources, decision making processes and management tasks. Care should also be taken to prevent overburdening of women and to automatically perpetuate and reinforce the traditional roles of women.

To achieve any of these women are most important. men should be sensitised on gender issues, their own roles and those of women in water and sanitation projects and programmes.

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IS EARTH THE PLACE FOR ME?

Choking clouds of dust ascending
From man-made roads of madman's making
Trees, like fallen giants, shaking:
All God's fragile creatures quaking.

What I want to hear and see,
touch and breath - take within me
are all consumed in great confusion:
Progress leads to soul's disruption.

Clatter of grass-cutter, rasping, chafing,
Scatters thought with mechanical grating,
Glad distraction: calms and soothes
Solace to my tired nerves.

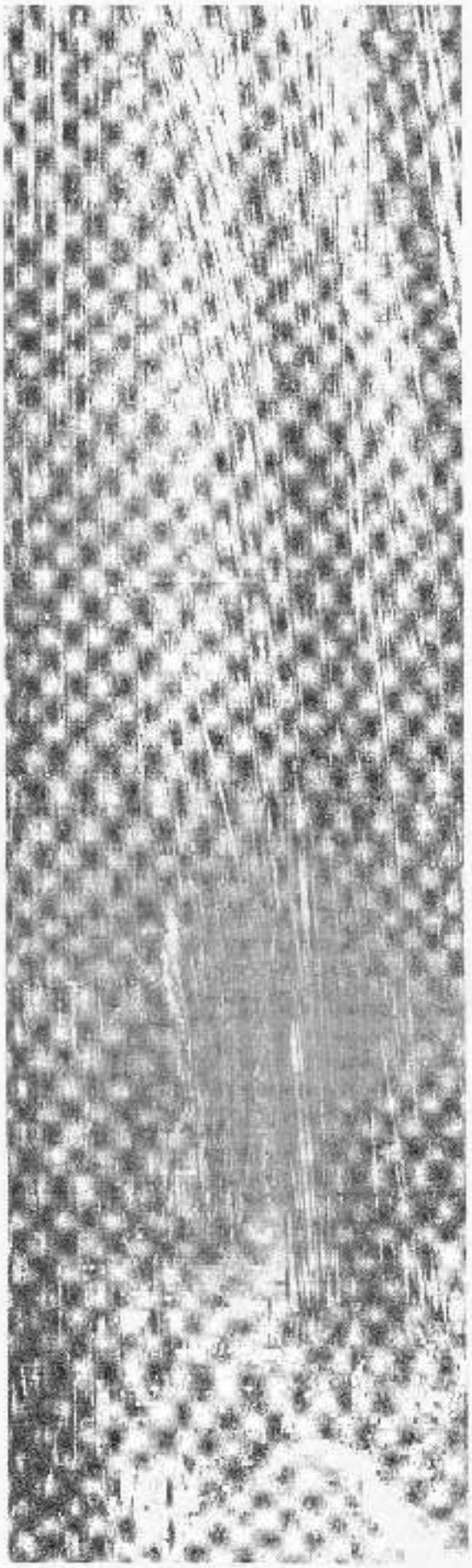
Pent-up scent of grass releasing
Its rhythmic beating like the breathing
living heart of Mother Earth,
Comfort with each gasping breath.

The birds that sing at dawn's awakening
Break the discord of our making,
Life that yearns towards the sun
Loosing peace from deep within.

We are blind children of the light:
I want to reach the circle bright
Suppressing all sense limitations

I want my own Garden of Eden.

Faith J. Rathnayake



Harvesting Rainwater

Water is one of the basic needs of human beings. Therefore, the available water in terms of quality, quantity and in time will have a major influence in the standard of living of any community. Though water is a renewable resource, it is available only in finite form. The growing population, urbanization, industrialization and agricultural activities have created heavy pressure on the limited water resources and thus water scarcity became a serious problem in many parts of the world. Lack of water not only has an impact on water security but also it threatens food security. Water crisis is a global problem and hence, looking for alternative source of water or more efficient use of water becomes very, very important in addressing the water scarcity problem and for the use of future generation.

Sri Lanka has plentiful water resources in aggregate terms, but this overall picture is very misleading because there is a high degree of variation in the availability of water seasonally and regionally (Water Vision 2025 Sri Lanka). The island receives an average rainfall of 2000 mm yearly and based on the rainfall pattern and amount the country is mainly divided into Dry and Wet zones and major portion of rainwater escapes as runoff water to the sea. Agriculture consumes a giant portion of water and the projected demand for water by various sectors is as follows.

Table 1:

Projections of Water Demand by the Year 2025

Purpose	Current (%)	2025 (%)
Drinking and domestic	06	16-20
Irrigated agriculture	85	70-75
Industry	06	10-15
Others	04	05-07

Source: Adapted from Lanka Jalaya.

Pipe born water supply schemes are mainly concentrated in the urban area of which only 1/3 rd has the capacity of providing 24 hours services. Majority of the rural community depends on dug wells or tube wells for water requirements.

Table 2:

Current Water Supply Situation

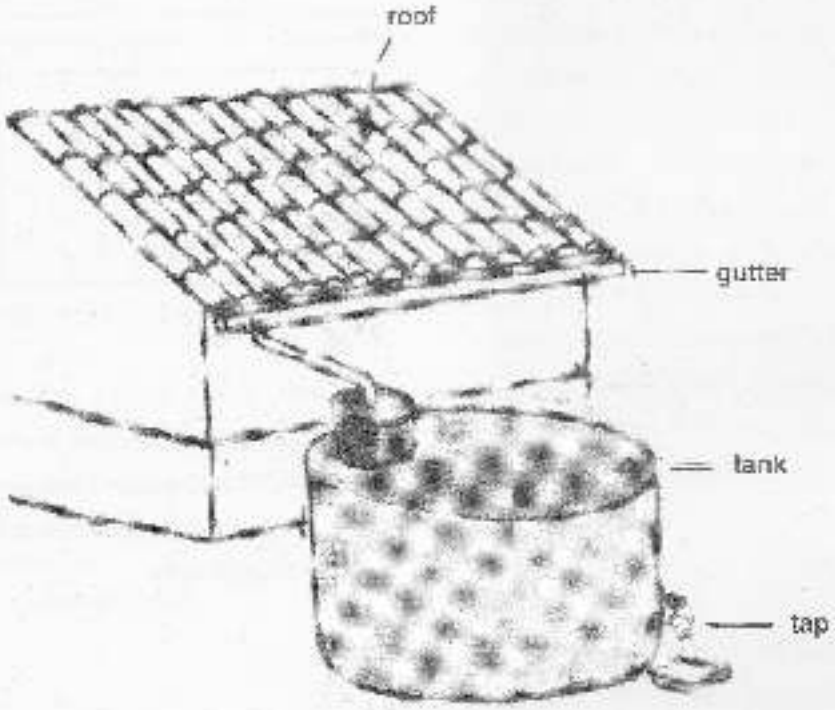
Sources	Urban	Rural	Total
Pipe born water (%)	75	14	32
Tube wells (%)	10	11	11
Protected dug wells (%)	10	40	24
Others (%)	05	35	33

Source: Sri Lanka Water Vision 2025, Framework for Action

According to the Public Investment Programme of 1996-2000 Sri Lanka needs to invest Rs 6000 million (US $ 112 million) annually to achieve safe drinking water for all by the year 2010 (*Adyabendu, Adyananda and Hapugoda,2000*). However, the current annual expenditure is only Rs 3500 million, which is inadequate to meet the increasing demand. Groun water is increasingly tapped for agricultural and other development activities and dumping of industrial and other wastage in water bodies further limits the supply of water.

this rainwater harvesting becomes a feasible option in addressing water scarcity problem.

Rainwater harvesting is not a new concept and it has a very long history all over the world. Even in Sri Lanka rainwater harvesting technique has been used in the 5th century rock fortress of Sigiriya.



The current per capita water availability of 2400 m3 will end up with 1800 m3 in year 2025, which is just above the water scarcity threshold of 1700 m3/capita. Therefore, relevant authorities face serious set backs in their targets in supplying adequate portable water. In a crisis situation like this, alternative water sources are necessary in fulfilling the basic needs of the people. **Especially in dry seasons, the people living in rural areas face a number of difficulties in fetching quality water. They have to walk a minimum 3-4 km in fetching a pot of potable water and women are the first victims of the scenario. In a situation like**

However, with the introduction of pipe born water supply scheme, many rainwater harvesting technique have been forgotten. The recent technological development in rainwater harvesting offered much hope for the rural peasants.

A systematic rainwater harvesting technology was introduced to Sri Lanka by the Community Water Supply and Sanitation Project (CWSSP) of the Ministry of Housing and Public Utilities. In 1995, this project was initiated in Badulla and then expanded to various parts of the Island.

Two types of tanks were designed and both are 5 m^3 in capacity. The ground tank is made of ferrocement and the under ground tank is an adaptation of the Chinese underground biogas pit.

The most important concept in domestic rainwater harvesting is that, "harvest the rainwater while it's raining, preserve it and use it for future needs". In domestic rainwater harvesting, the roof area acts as a catchment and the water is diverted to the tank through the gutters and down pipes. A simple device (first flush system) will drain out the first rainwater to go out as it contains dust and dirt and charcoal and pebbles are used as filtering materials to improve the quality of rainwater. **However, the quality of rainwater depends, how committed you are in operating and maintaining the system and people use it for even one year with dedicated and careful management.** To do that, the roof area must be kept clean and the gutters and down pipes must be properly fixed in order to avoid stagnation of rainwater, which could lead to mosquitoes breeding collection of leaf materials. Also, the lid of the tank must be tightly sealed to avoid the sunlight and mosquito breeding. Sunlight will promote algae growth and it will decrease the quality of preserved rainwater. In general the rainwater users are advised to clean the gutters, down pipes and filters once in three months and the tank twice a year. Rainwater users living in water scarce area give top priority to maintaining the system, keeping the quality of rainwater high and they treat the system as a precious asset.

This saves time from fetching water which can be used in other socio-economic activities. They can spend more time with the family and some engage in income generating activities like small scale home gardening, animal husbandry, boutique keeping, handicraft making etc. Attending village meetings or women's societies meeting, shramadana, religious functions, funerals etc are some social benefits of rainwater harvesting system. Unlike a pipe born water supply scheme, rainwater harvesting system makes the recipients more independent. They don't need to worry about the water cut or technical errors of a centrally managed water supply system. It gives more authority and responsibility to the rainwater users as it is built in their home premises. An average five member household can depend

Nandawathi - Muthukandiya, Siyambalanduwa

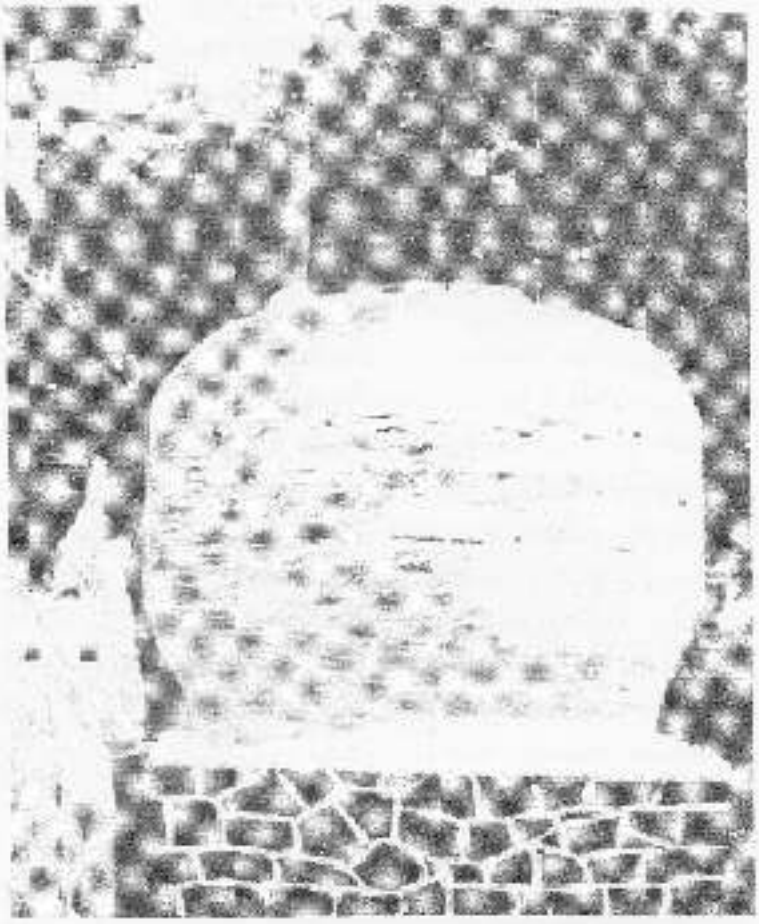
All household demands for water, such as cooking and washing were met using the water from the rainwater harvesting (RWH) tank. The last drought season was managed with water in the tank. She reported reduced instances of children getting infected by water borne diseases. Time spent previously on walking 2 to 3 km daily to fetch water from the village well was utilized in crop cultivation and opening a boutique - an income generating activity for the household.

Soma - Kudaoya, Buttala

All household water requirements for cooking, washing, toilet and sanitation are met with the rainwater harvested. Water from the tank is used for cultivation of greenery, such as, leaves, brinjals and ladiesfingers, which provide them with an additional source of income.

Source: *RAINWATER HARVESTING EXPERIENCE BY ITDG - SOUTH ASIA*

on a 5 m^3 rainwater harvesting tank for about 50 dry days, if the family water requirement is 100 l/day. There are classic examples in the rural areas that they cope up even extreme dry periods with careful management of harvested rainwater. Therefore, proper awareness for the beneficiaries, masons, constructing or implementing agencies are necessary for the sustainability of the project. Also, the beneficiary's contribution in constructing rainwater system is important in order to create a feeling of ownership. Usually the recipients are requested to fix the gutters, down pipes and other essential items in their own expenses but no set guide lines are available on the above.



Rainwater harvesting is not only an option for rural water supplies. It can be promoted even in the urban and industrial sector in order to meet various water requirements. In an urban environment, dust, vehicle fumes and industrial wastages may cause problems in the quality of rainwater. However, the urban households can use the rainwater for non-domestic purposes like, gardening, washing clothes, bathing etc that will bring down the water bill and simultaneously it will reduce the usage of purified water for the above mentioned purposes. In industrial sectors rainwater can be used to flush the toilets and floor washing and thereby can reduce the tapping of other water sources. Proper harvesting and storage system will ensure the water to be used in the future. *Also, the government and the policy makers must think about the rainwater harvesting system as a possible water supply source in our country.* In certain countries rainwater harvesting is an essential component, while building new houses. Therefore, provincial councils, municipal councils and urban councils can play a major role in promoting the rainwater harvesting technology. Preservation of water is not somebody's business and it's everybody's business. Having a rainwater harvesting system will ensure your contribution to save the water for the future generation.

V. T. Yogarajah
Coordinator -
Lanka Rainwater Harvesting Forum.

Folk Songs of the Gonds

Water Girl

O water girl ! with tinkling anklets
That sounded under the dark mango tree
O water-girl ! your pot of bronze
Is shining in the setting sun
Your lips are dry and thirsty as my heart
O water-girl ! with swaying hips
Go to bring water from the lonely well
Fear not the dark, I'll go with you
My heart is thirsty, water girl.

The Well: Two Songs

Cool in summer's heat
Warm in winter's cold
Is the water in the well
And the body of my love.

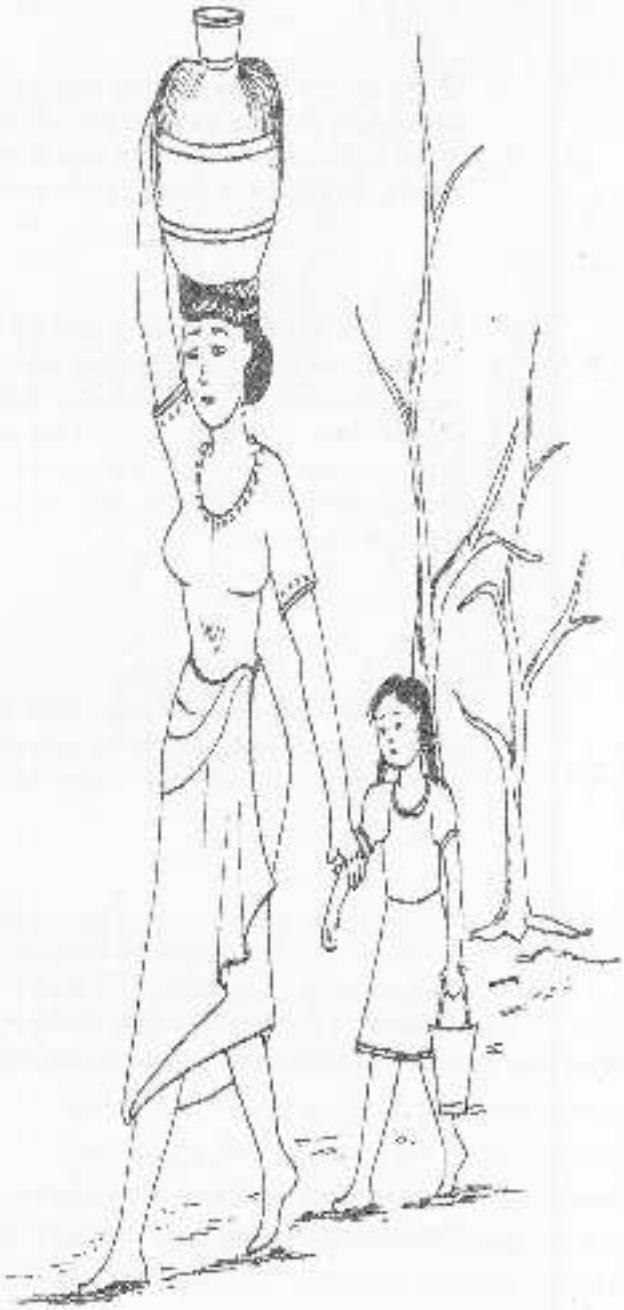
In my garden is a well
And round it hang the mangoes
How deep and cool my well is !
But you are deeper far in love
The sun beats down and you are thirsty
But you care not for my water
You know the deep love of the heart.

O Little Well

O little well, you give no water
Your youth is past
Think, well, your youth has ended

Who can tell ?

She goes with her pot of water
But who can tell the sorrow of her heart ?



"The Gonds are of Gondwana, the highlands of Central India. Hoised through the Melkal hills and the forests around Mandla, they are described as one of the poorest peoples on earth", but has a proud history : until the 16th century they ruled as powerful kings over the Gondwana, but by the 20th century they had become subsistence cultivators settled in small villages or working for a pittance in the forest or on the roads. But the poverty of their material life is far from entailing any poverty of .....poetic sensibility."

From The Penguin Book of Oral Poetry, edited by Ruth Finnegan, Allen Lane, 1978, p. 13

sent in by -
Dinali Fernando

Water Points

Of the myriad issues that aim to cut poverty and environment, few are as critical as getting safe drinking water to the 1.2 billion people who go without it. **The European Union has warned the world was in a global water crisis, and made the issue a priority for the World Summit on Sustainable Development in Johannesburg.**

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The United Nations says that at least 1.2 billion people lack access to safe drinking water, 2.4 billion lack adequate sanitation. More than 3 million people die every year from water related diseases, the UN estimates. Most of the world will not have enough water in the next 30 years. This combination of scarcity and bad management affects food supplies, health, education, culture and economic development. It means women spend long periods collecting it, families spend up to half their daily income on it, farmers lose their land and infants die.

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"The global water crisis is a major threat to sustainable development - to economic development, to poverty reduction, to the environment and to peace and security," says Margot Wallstrom, EU Environment Commissioner.

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Halving by 2015 the number of people with no access to clean water and sharply reducing those who lack adequate sanitation are key targets in a draft action plan at the Johannesburg conference. The draft includes a call for countries to make water and sanitation a priority in national development plans, improving sanitation in institutions, such as schools and promoting safe hygiene.

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The UN Secretary General Kofi Annan has put water at the top of five areas which need clear commitments - energy, health agriculture, bio diversity, with water right at the top.

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Global consumption of fresh water is doubling every twenty years and new sources are becoming scarcer and more expensive to develop and treat.

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Most of Africa, the Middle East, South Asia, the Western United States, South America, China and nearly all of Australia are already in trouble. In the burgeoning slums of the developing world, water and sanitation problems are acute. Up to 3 million people die every year of easily preventable water borne diseases.

(Source: Australian Weekly, August 2002)

Water Pollution

Nilushi Ranaweera

The recent interest in the broader issues of environment and development and the interconnection between them has brought into focus the significance of the part played by women. Indeed, women are highly visible throughout the humid tropics. Carrying fuelwood, fetching water, pumping water, working in the fields, selling at the market, and so on.

'Water' is a source of life and human civilization. Over the years, women have accumulated an impressive store of environmental wisdom and have always been the ones to find water, choosing their source according to accessibility, availability, distance, time, quality and use. It is justifiable to refer to women in developing countries as water suppliers and water managers.

In this article I would like to base my comments and information on water and its various linkages with women, such as water suppliers, victims of the environmental pollution, project developers, etc.

Suppliers

In rural or poor urban areas, women are almost entirely responsible for the daily collection of water for domestic use, and it is the women who allocate water for it's different uses within the household. The daily task of drawing and carrying water involves walking distances of as much as five kilometers or more, to the source of water, waiting in a line at the pump, which as a direct result of poor maintenance and design, is not a pleasure and then returning with a load which may weigh as much as 20kg.

Even in urban areas, it is women who are largely responsible for collecting water; the walk may not be there as in rural areas due to the public water points - usually on the more important roads - but waiting in line is still a problem. In the shanty towns there is generally an absence of public water points, and here women tend to rely on vendors for water, (mostly in Africa) paying a price which they are not able to afford. For example, an appraisal mission from the Canadian International Development Agency (CIDA) in Nicaragua reported that the cost of connection to water system was between 25% and 70% of the annual income for low to middle income earning women. A grassroot level foreign experience states that "With only one stand pipe to provide drinking water for 50 families, the squatter dwellers have drawn up time slots for each family to collect water for their needs, some

have to collect water at two or three in the morning and most often it is the women who have to do it since their men are not going to wake up to do this! The women have to bring their children with them for fear of being a lone person at that time.....".

Health

Women's health is often adversely affected as a result of greater exposure to certain environmental health hazards. Diminishing resources of water and wood ultimately cause women to go greater distances in search of these basic supplies; and also save time to attend to other responsibilities such as cooking, washing, cleaning, baby sitting etc., women carry larger and heavier loads, which have negative impacts on their health, such as skeletal problems leading to deformity and disability.

Apart from these health problems women, due to their child bearing role are physically more sensitive than men to the environmental pollution, which has adverse effects on the unborn child. As a result of industrial development seeking cheaper rural areas more rural women face pollution as a major health hazard.

Education

In many communities fetching water a "*woman's role*" begins at an early age when girls accompany their mothers on the daily routine walk to the water source. They start with a small container, and the size of vessel carried grow with the growth of the child.

According to a study in Kenya it is found that 70% of all the trips to collect water was made by women over the age of 15 years. On average they carry loads of 20-25 kg distances of 3.5 km. 1.5 times a day. The walk to the water source was often over rough terrain when temperatures were up to 40c. When the girls accompany their mothers to fetch water education is neglected. As the collection of water can take up to 60% of women's and girl's time, it is not surprising that it is one of the reasons why young girls abandon school.

Water Projects

The traditional role of women in water resource management is the subject of a study carried out by Professor Josep Ouma of Kenya in the region of the inner basin of Lake Victoria. According to him "Water should be seen through women's eyes.....". Because women are often referred to as water suppliers and water managers. They play a massive role in the society when it comes to water.

However, women are almost entirely absent from the professional sector, such as, in advisory and policy making levels regarding water. Women's knowledge and experience in the supply and use of water can be invaluable when tapped.

Taking these aspects for consideration in 1996 UNESCO launched a special project entitled "Women and Water Resources Supply and Use" to be implemented in the sub-Saharan region of Africa, as a part of the International Hydrological Programme (IHP). This project aims at improving the quality of life of women in rural and urban areas in sub-Saharan African Countries, by facilitating their access to water resources and by improving water resource management. Today, it aims to disseminate and share this information, and to spread the message of fair distribution of water.

Among the achievements of the International Decade for Drinking Water Supply and Sanitation (1981-1990) was the attempt to draw in more women participants.

The importance of gender dimension was pointed out in the discussions at the International Conference on Water and the Environment, (Dublin, 1992), and it devoted one of its four principles to women.

"Women play a central part in the provision, management and safeguarding of water. - This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principal require positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision - making and implementation, in ways defined by them". "Women have a vital role in environmental management and development. Their full participation is therefore essential to achieving sustainable development". *- According to Principle 20, Rio Declaration,*

Protect and Manage

Water is the source of life, but the same time it can be a source of conflict too. With finite fresh water resources on the one hand, and an increasing demand on the other, the need to protect and manage water resources properly has never been greater.

If we consider that access to a supply of good quality water at an affordable cost is a basic need for all and that it is intrinsically linked to our rights to health and education, it goes without saying that when talking about ethical and moral values related to water and human life the woman factor is of the utmost importance.

The waters of Kandalama tank ripple gently, soothingly under a cool morning breeze. As the Sun rises, the land would begin simmering and the monkeys and squirrels belonging to the forest would seek shelter in the arms of its many trees.

Only the birds, the king fishers, long-legged storks and herons would remain unmoved by the heat of the sun, patiently to attack the unknowing fish that swarm to the surface of the water.

But at the moment it is peace that moves me, enfolds me. The landscape and I are in harmony with the universe.

The single tree under which I sit stands isolated from the rest. Like me, it stands poised on the edge of the bank so that some of its roots dip into the cool, dark water beneath.

Punyakante Wijenaike.

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Traditional Methods of Water Purification

Muddy water is made clear in some countries by using the seeds of the nirmali tree (*Strychnos Potatorum*), also known as Kataka. A thick paste is made of the seed and added to the water in which the suspended articles coagulate and settle at the bottom. The clear water is then transferred to a storage urn and the process is repeated.

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Another cleansing technique - also with the same seed - has reportedly been used for over 400 years in which the seeds are rubbed on the inside of water storage vessels.

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Seeds of the drumstick tree Murunga (*Moringa Oleifera*) are used to purify water as it is believed that they inhibit the growth of bacteria. This system is practised in the rural areas of many developing countries, and widely used in Indonesia, it is reported. The plant is said to have come to India from Africa. In the Sudan it is called "clarifier tree". Tests done at the Polytechnic of Blantyre in Malawi show that Moringa is as efficient in removing sediments as (*aluminium sulphate*), a powerful coagulant widely used in water treatment plants around the world. In southern Kerala, wiry roots of ramachcham (*vetiveria zizanoides*) are placed in clay jars pierced with tiny holes. Water filtered through the roots is not only clearer, but also has a pleasant smell.

In Our Cultural Lives

Deepthi Niroshika
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In the human body, two thirds is water. In the survival of human beings, all of all living things on the planet, water is a vital ingredient.

The earth, as a planet with water, is often known as the "Blue Planet". Seventy percent of the earth is covered with water in the form of oceans, seas, rivers, lakes and glaciers. Of the earth's water, ninety seven percent is brackish and unfit for human consumption. Two percent of the balance is in the form of ice and snow present in icy regions and the tops of mountains. Only the balance one percent can be used for human consumption.

Of all the uses of water, drinking takes first place. The main ingredient in preparing food, bathing, washing and cleaning, is water. In almost every daily activity water is of prime importance. In addition, in agriculture and the maintenance of industry, in generating power, transport, in the fishing industry in both the ocean and in land, water takes first place. In any analysis it will not be possible to determine which activity does not need water.

The early settlers made it a point to settle down in places close to waterways. The Indus valley and the Tigris Euphrates civilisations are examples of this. In Sri Lanka it is recorded that Prince Vijaya and his seven hundred followers first selected the area close to the Malwatu Oya due to its close proximity to water.

These early civilisations were known as **hydraulic civilisations**. The proximity to water was a symbol of the prosperity of any society. Due to this, ancient rulers gave priority to the provision of water in the form of tanks and other storage facilities for rain water. They appointed various officials for the single purpose of distributing water and other administrative activities connected with water, as evidenced by studies of the Anuradhapura and Polonnaruwa regimes. There is evidence of the high level of techniques that the early rulers of Sri Lanka used in the building of tanks and of the important place given to the storage and use of water in those early days.

Thus today we see the Minneriya Wewa, Yoda Ela, Parakrama Samudraya and other smaller tanks as evidence of the importance that was given to water as well as the scientific techniques that were used in their building. These also give evidence of the belief in gods as protectors of water which grew as time passed.

King Parakramabahu who ruled in Polonnaruwa once declared that "not a drop of water which falls from heaven shall be allowed to go to the ocean". This saying symbolised the fact that no other medium can bring about the prosperity of a country as water and that optimum use of this gift from heaven should be taken.

The accelerated Mahaweli diversion project too illustrates the importance of using water for the development process of the country. This water is of prime importance in providing the people with their daily necessities of rice, fruits, grains and vegetables. Water is crucial to agricultural development and when there is a scarcity of water agriculture suffers and becomes a challenge not only to the daily life of the people but for the economic sustenance of the whole country.

In addition, water is a source of electricity for the country. In Sri Lanka water is one of the important sources of power and energy. For this reason during periods of drought there is a shortage of power which affects not only the daily lives of people, but also the production processes of factories and other industrial work places.

In providing nutrition to the people too, water plays an important role. Marine life, both ocean and inland fisheries, contribute substantially to the food needs of the world. In addition today we see water as a commercial commodity in the sale of bottled drinking water. Distribution of water through pipes can also be considered as a commercial venture. In this way the economic face of water can be seen and how it has today become a resource that is gaining in value daily.

Water also occupies as close an important place in the social life of the people. A host of customs and rites connected with water are prevalent among people. In times of water scarcity various rituals and appeals to the gods are conducted to end the drought. Bodhi Pujas, pirith chanting are common among Sri Lanka Buddhists. According to scientific research it is said that in some societies, **cattle and women are sacrificed to the gods in their appeals for water.** In addition, it is customary to consult astrologers and decide on auspicious times before starting the job of sinking a well. The first pot of water from a new well is used to bathe a Bo tree. This practice is still prevalent among some communities. In daily life too water is often considered holy and a symbol of prosperity. It is auspicious to meet someone carrying a pot of water. In the Buddhist marriage ceremony water is poured on the joined hands of the bride and groom. In cultural practices connected with the rituals observed when a girl attains puberty, water plays an important part.

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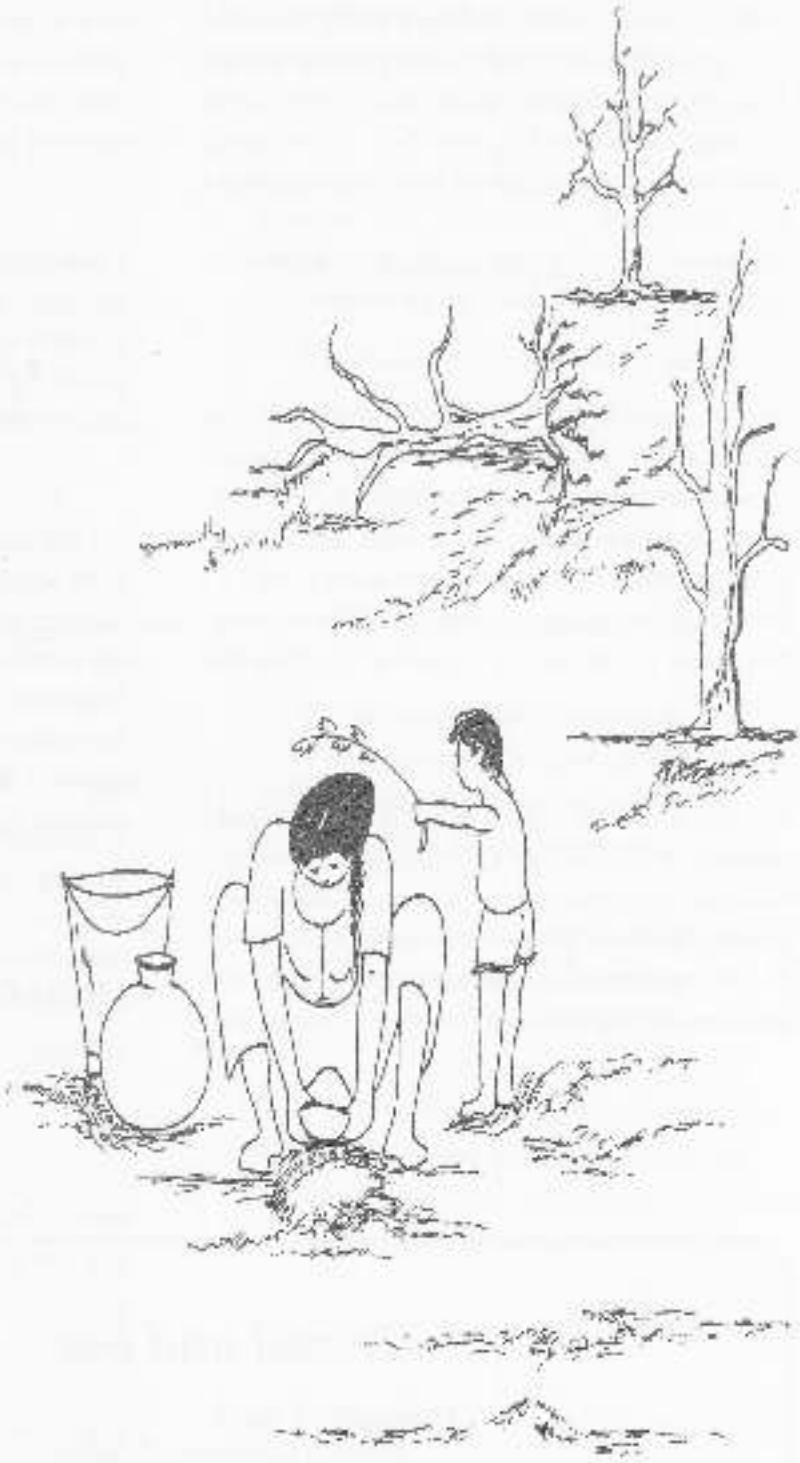
There is a close relationship between water and religion. Monks on their way to beg for alms must carry a 'perahankada' (*water strainer*). Also, in the city of Vesala the Ratana Sutra was chanted and pirith water was sprayed throughout the city to rid itself of fear. When a young man enters the Sangha as a samanera his parents offer water to the Sangha. The water pouring ceremony when offering alms to the Sangha in memory of a dead family member is a popular rite in Buddhist homes.

According to Christianity when God created the world the earth contained only water. God created man and gave humans the power and strength to exist through water. When an infant is baptised, at confirmation, in marriage ceremonies, in making offerings to the gods, water is given a prominent place with the belief it will bring good fortune.

According to Islam every living thing is born of water. The new born infant is first bathed and at the end of a person's life, water plays an important role in customs connected with death as well as in the after life.

In Hinduism there is a strong bond between religion and water. According to practitioners of Hinduism, it is believed that the sacred river Ganga has as its source

the head of Vishnu. The famed annual festival of Kumbha Mela is associated with the river Ganga. Immersing in the water, it is believed, rids oneself of all sins committed in once lifetime. According to the Hindu vision one of the constituents of the world is water. It is clear that through these beliefs they act in accordance with not only the material worth of water, but also its spiritual value.



It is apparent that water is closely connected with man's economic, social and cultural life. The social and economic importance of water has been strongly focussed on in recent times as it is gradually becoming a scarce resource. Rapid industrialisation in all parts of the world is one of the chief causes of this. Factory effluents flowing into waterways have caused untold harm in polluting water. Increasing industrialisation has caused scarcities of water in urban areas. There is a gradual decrease in the value of water with careless and extravagant use of water. On the other hand careless use of water has resulted in ill health and costs enormous amounts of money for treatment of diseases.

Women are the main victims of water scarcity and pollution. Especially in developing Asian, African and Latin American countries, women have to spend an appreciable part of their time and their physical effort to find water for daily necessities.

In water scarce areas research has found that the hardship of water scarcity is mostly on women. Surveys by United Nation agencies have shown that in some African countries a women spends about eight hours a day to fetch water for her and her family's daily needs.

Just as scarcity of water adversely affects the social lives of people, so do floods. Floods common in many Asian countries displace people, destroy their homes and deprive them of their livelihood. Floods cause irreparable damage to human lives, causing death and economic instability. For example, in Bangladesh one of the main causes of social instability and poverty has been identified as constant floods.

Today it has become vital that strategies for systematic use and distribution for water and ways of conserving this precious resource be devised. Currently there is the concept of water management being practised in many parts of the world. In 1992 an international conference on "Water and the Environment" formulated the following principles in the future use of water.

The first is the vital nature of inland water a human resource. It focussed on the importance of the link between life, development and the environment. Secondly the conference focussed on the development of water sources, management of water and the importance of peoples' participation. Thirdly, the role of women in procuring, management and conserving water and fourthly, the economic value of water and that water should be considered as an economic product.

These principles once again stress the importance of the careful use and conserving of water. They are also a guide to the formulation of a consumer pattern which should be adopted as a strategy to inform and educate the younger generation.

It is only human beings who have the ability to protect water which has a vital link with all aspects of human life-cultural, social and economic. If everyone joins in this endeavour by ending the destruction of the environment and preventing the free flow of effluents into waterways, they will not only protect water but also provide a practical solution to a serious problem that confronts the world today.

Translated from Sinhala -
by **Vijita Fernando**

Friend and Foe

Water in harmony with nature
flows in rivers, ripples in lakes and
smiles at the Sun from ocean's deep
Water in disharmony with nature
Rushes, overflows and rolls in waves
driven to anger by a wind
that whips down trees
and rapes the land.

Punyakanthi Wijenaike

Water Policy

The issue of water conservation and the crisis that is emerging as a result of insufficient attention given to proper management, conservation, prevention of depletion and massive pollution are of crucial importance to lives and livelihoods of millions of people of the present and the future and the very survival of nature.

'A number of warning signs point to increasing water resources problems in Sri Lanka. Competition and water shortages will increase as a result of highly variable rainfall and growing demand for water. watersheds are being degraded, resulting in sedimentation of reservoirs and more serious floods and droughts. Water pollution from domestic, agricultural and industrial sources is contaminating surface and groundwater and effecting public health. Groundwater is being over extracted in some areas, effecting the availability of water for others and for environmental values.'

Policy objectives have been formulated ensure the use of water resources in an effective, efficient and equitable manner, consistent with the social, economic and environmental needs of present and future generations.

Some of the more important ones are -

* Facilitate national development.
* Conserve, and recognize the value of scarce water resources.
* Ensure equitable sharing of water resources for meeting current and future demands of the population through an efficient allocation system.
* Safeguard investments in water resources development and other sectors of the economy by providing water rights and entitlements.
* Improve standards in the maintenance of safe quality of water sources required for various water uses.
* Ensure a healthy environment and sustainable use of both surface and groundwater resources using a comprehensive, river basin approach.

The Proposal

What is proposed is for the State to become the "owner" of all water including ground water and brackish water, except seawater. A National Water Resources Authority (NWRA), a Water Resources Council (WRC) and a Water Resource Tribunal (WRT) would be set up, having a strong and authoritative position in Government, reporting directly to the Chief Executive (President of Sri Lanka).

The NWRA will prepare policy and will have the power of water allocation through issuing of water entitlements. The NWRA will also be responsible for long term national and river basin planning. These bodies will be responsible for coordination, planning, regulation and monitoring national water resources. They will have higher level of authority than other national water agencies.

The system of granting "water entitlements" clearly aims at "pricing" of all water. It is said that right to use water will be granted through water entitlements. Although it is stated that small scale users and individual water users supplied through group schemes will be exempt from the requirement to hold an entitlement, there are other ways included in the policy and strategy of implementation that will compel these small scale users to pay for their water and these costs are bound to be very high. For instance the small farmers who are now using irrigation would be formed into Farmer Companies and it is said that these in the long term (once they are formed) would be the entitlement holders on behalf of the individual small farmers. Thus the farmer companies will come under scheme of water resource management cost sharing.

The farmer companies in turn will have to develop ways of water allocation among individual farmers who will have to share costs.

In this policy recommendation it is said that non plantation sector agriculture will not grow unless agriculture is shifted from the present type of low value crops, such as paddy and other domestic food crops to high value crops, meaning mainly export crops.

It also says that the present types of small farmers are unwilling to give up paddy and other food crops. Therefore, they must be encouraged to sell their land and move out of agricultural livelihoods. According to this report one of the main reasons for these farmers' unwillingness to give up paddy and to remain in agriculture is the fact that water / irrigation is given to them free.

The report clearly says that "water is a commodity" and therefore it should be "marketed". "Marketing of water should be done by the private sector and not by the Government". For this purpose it is recommended that water property rights should be established. The intention becomes even clearer when the World Bank says that one of the main problems of lack of growth in this sector is due to the absence of a "free land market in the rural agricultural sector". Therefore the Government is advised to take immediate measures to create a "Free Land Market".

The Report of the World Commission on Water for the 21st Century, recommends, "Marketing of water with full cost pricing" as their "single most important recommendations". This is said to be the only effective way of attracting the private sector to invest in water.

The World Commision feels that the huge investment needed for the water conservation and management that the world needs, to avoid future water crisis must almost entirely come from the private sector.

Big Transnational Companies like "Monsanto" has already decided that there is going to be a "world water crisis in the future. Since water us essential for human life they have already begun to initiate a "water business throughout the world".

The World Trade Organization (WTO) is in the process of including other important areas into their Trade Agreements. There is a massive effort throughout the world to get "water declared a commodity".

Pricing of Water

The necessity to pay very high prices for water will also apply to other individual small-scale water users, such as the domestic consumers in urban areas, since the activity of urban water supplies will be transferred to private companies. Such companies would be invited to obtain "bulk entitlements". The process of inviting private companies for urban water supplies has already started in Sri Lanka.

This concept is clearly and strongly emphasized in the Sri Lanka policy since the entire approach to conservation is based on "pricing of water". It is said that pricing would lead to prevention of waste and diverting the allocation from "low value uses" to "high value uses".

This in hand of the private sector would mean the use of pricing mechanisms to divert water away from those who can pay less (the poor) to those who can pay more (the rich). This includes the wasteful consumers who can pay higher prices. They can also be the worst polluters of water in a poor country such as Sri Lanka since we are so dependent on the high prices they appear to pay.

Cost of Infrastructure

Let us now look at two other very important issues that would arise. It is stated under "Water Saving Technology" in the policy document that water-measuring devices will be required as a condition for water entitlements. It is obvious that water-measuring arrangements will have to be made at all levels. A private company obtaining a bulk entitlement either for supply of water to individual household or any other small scale consumers or to any individual small scale farmer will have to have arrangements to measure water delivered up to the very last point of consumption. This can only be done using one of two ways. One is to have cemented channels with sluices for measuring water up to each of the farm plots. The other is to have piped water with meters fixed at various points up to the last point of delivery.

It is already admitted, in this document that the private sector bulk water users or private sector investors in water would not be willing to bear this kind of infrastructure costs, unless they could recover their investments with considerable profit margins. (The example given in the document is the case of the attempt made to provide additional water requirements to the Katunayake Export Processing Zone from Maha Oya in Chilaw by the Negambo Municipal Council).

This has also been proved in all other infrastructure development projects of massive scale undertaken by the Government during the last two decades, precisely to attract foreign investors, such as the Mahaweli Diversion, the proposed super Highways, the Air Port, Harbor and electricity, roads and other infrastructure expansion projects of the recent times.

The four super highways and the proposed "Ruhunupura Mega city proposed, a few years ago, to be built in Hambantota to compete with Singapore were initially planned to be built with private sector investments. Now the Government has realized that no private investments would come for these and therefore the Highways to be completed within the next 3 to 5 years will be done by the Government taking loans from the ADB and other sources and

the mega city project is now not much spoken about. The infrastructure costs for this proposed water measuring and pricing of water is likely to cost even more.

The water policy makers in Sri Lanka and the World Commission "water visionaries" are not totally unaware of the reality that the poor millions of people will not be able to pay such high costs. Therefore it is proposed in the World Commission that while "full cost pricing" is done to assure the profits of the private investors, the governments must undertake the role of subsidizing the poor to be able to pay for the water. They also say that the level of subsidies will depend on the abilities of each government. This mechanism for transferring public funds to the private sector may be workable in richer countries.

We know very well how insufficient and inefficient these "safety nets" have been in meeting the minimum requirements of the poor in Sri Lanka and most other poor countries.

Therefore, it is very clear that this entire venture, that claims to achieve efficiency (including economic efficiency), sustainable management and equitable distribution would be prohibitively costly and totally uneconomical for a country such as Sri Lanka. In Sri Lanka there are such large numbers of poor for whom water is essential for survival will simply not have water, since they cannot pay these massive costs and the government obviously will not be able to sufficiently subsidize their essential water needs. The above infrastructure, therefore, will be more for preventing such people having access to water rather than for conservation and equitable distribution.

Ecological implications of profit motivated water management

The second, more serious issue is its ecological implications. The policy claims to be for conservation, efficient and environmentally friendly management and use of water. The approach proposed would isolate water almost entirely from the eco- system, cementing of channels and or channeling of water in pipes almost through out the country, would mean that they would use the most effective ways of preventing or minimizing water from linking up with the rest of environment. This is unlikely to lead to a process of managing water in harmony with nature.

It is a real tragedy and an unimaginable disaster that such an approach has been proposed in a country that can claim to have made one of the most valuable contributions in the history of human civilization in its many centuries of development of eco-irrigation.

Isn't it really surprising that the process of formulation of this policy that seems to have been done over several years, does not make any reference to the wisdom that was available in the ancient history of irrigation in Sri Lanka, so strongly rooted in the ecological considerations of water conservation and water management. It is obvious that this expertise and knowledge that is available and so well documented by our own engineers such as D.L.O. Mendis and eminent authorities like Brohier have not been consulted. The policy proposals lack the very simple understanding that the most efficient and the only sustainable way of conserving water is by allowing it to function in its relationship with the rest of nature. This in the market would be considered wastage.

Can "Pricing of Water" and "Water Marketing" be an efficient way of Water Conservation and Water Marketing

With the history of experience and knowledge mentioned above, let us look at the non- market approaches available for water conservation and management.

There are two forms in which water is retained in nature. These forms are sometimes named as "Blue Water" and "Green Water". Blue water is the water that is available in the rains, lakes, rivers, reservoirs, seas and water storage underground. Green water is the water stored in trees, forests, in soils by the roots etc.

The entire approach based on 'pricing of water' or 'water marketing' leads to a process of taking water out of its natural links with the eco system to be sold to water users. It does not give value to the water that is retained in the soil, the trees, the forests etc. It will encourage the small farmer to allow less water to the surroundings, reduce seepage into the soil.

The channels would be cemented to prevent water from being absorbed by the surrounding soils, trees and animals. legal measures would be adopted to prevent village farmers from taking out a little of this water from the flowing channels or lakes to their farm plots. Whether this would lead to a net saving of water or a reduction in the water saving capacity needs to be studied seriously.

If we look at the net result of this on the capacity of the environment to retain water, the ability of an eco-system rich in trees, vegetation and forest cover to conserve and purify water and to reduce erosion and rapid drainage, the extraction of water for marketing may not be an efficient way of water management. In fact it can even be disastrous. When there is a plenty of forest cover, an abundance of trees, when the topsoil is not washed away and depleted by erosion much water is retained.

This is to say that ordinary people, the small farmers and peasants who are compelled by the present market conditions to live on what is given to them by nature are far more capable of undertaking much better forms of water conservation, of preventing water pollution, by undertaking low cost, more efficient and productive forms of natural, non chemical farming.

Such processes of ecological agriculture, agro forestry, soil conservation adopted in the organic farming approaches from the very small scale up to bigger scale systemic approaches to conservation farming could finally become a very effective approach in flood and drought prevention too.

Diversion of water into other uses and the objective of National Development

The Policy document gives much emphasis to the need to look at the multiple uses of water. While saying that irrigation as a particular sector needs emphasis and it should be given due importance the document also says that at present irrigation takes away 90 to 95 percent of the water resources. It also says that much of the irrigated agriculture today is in producing low value crops. The areas where new and increased water allocation is required mentioned are in industrial uses, urban water supplies, and hydropower generation and in recreational uses such as in tourism. These allocations and diversions will be done according to the objectives of "national development",

as seen by the government. When the Government becomes the "owner" of all water, it will have the full powers of doing so.

These multiplicities of uses have to be taken into consideration. However, serious questions have arisen today about the strategies that the governments are adopting towards "national development" and about the manner in which natural resources are being allocated for those purposes.

In industry the needs identified in the policy document are the requirements of the Export Processing Zones that the government intends to set up in all parts of the country in addition to what we already have. These zones are to attract foreign investments for industries such as export oriented garments. In order to promote this type of industrialization during the last 23 years (from 1977) we have allocated tremendous resources in the form of infrastructure development, building of the Air Port, Greater Colombo Development, the harbor, telecommunications, roads etc.

Now we are in the process of building 4 super highways and other infrastructure in various areas, we have also had to keep "labor cheap" to be competitive with other countries, which could only be done by suppressing labor rights. Even with these tremendous concessions and sacrifices we have not been able to attract sufficient foreign investors to help us in the much dreamt of "take off" to become a newly industrialized country. Instead we have kept on increasing the tax holiday periods from the 5 years in 1977 in the FTZs up to 20 years now in any part of the country. This means that we are not getting any returns so far to compensate for the huge costs that we have incurred.

Suggested Alternatives

The point that we are making is that there should be careful thinking before we agree that the government should be the sole owner and the only decision maker on water allocation, considering the fact that the Governments now are no longer the right guardians of the national and the natural resources that all living creatures need.

The right of the farmers to own the irrigation tanks and reservoirs is based on the fact that they built them and protected and maintained them for centuries and handed their ownership rights to their next generations. They also have the right of ownership to the water resources since even today they are far more capable of conserving water in harmony with nature if they are properly guided in sustainable approaches. Water conservation in harmony with nature is quite a different activity from water conservation, using market mechanisms.

A large scale mobilization of people in conservation farming, ecological farming starting at the level of small scale organic home gardens to bigger scale conservation approaches, methods of re-foresting watersheds and catchments etc. may be more effective and far less costly.

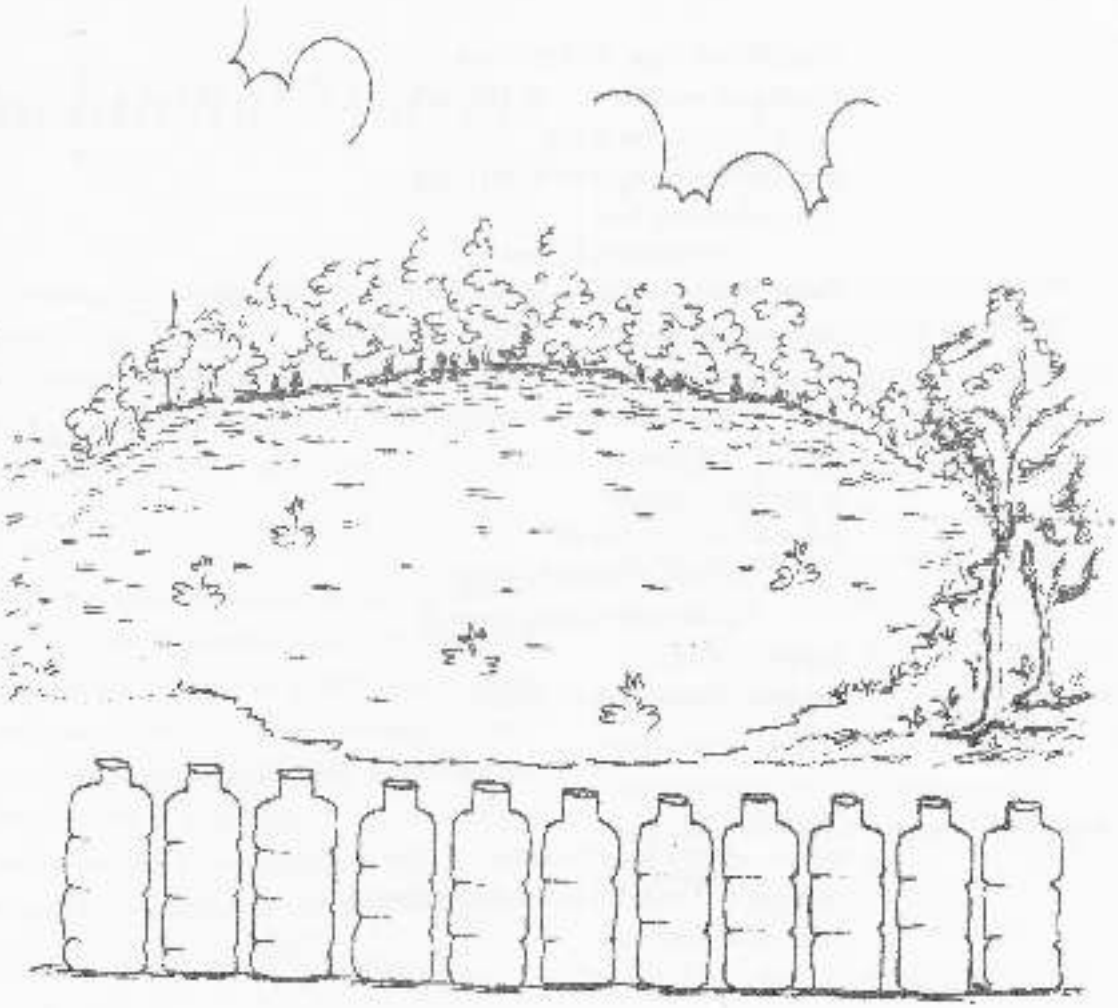
There are also methods of paddy farming that are now being tried out by several innovative farmers where the use of water could be reduced by about 50% or more, still getting a harvest of more than twice the present

average yields. This method discovered and applied successfully in Madagascar is called System of Rice Intensification (SRI).

The World Commission for Water in the 21st Century Report begins with the following words. *"Water is life, every human being, now and in the future, should have access to safe water for drinking, appropriate sanitations, and enough food and energy at reasonable cost providing adequate water to meet these basic needs must be done in an equitable manner that works in harmony with nature. For water is the basis of all living ecosystems and habitats and part of an immutable hydrological circle that must be respected if the development of humans activity and well being is to be sustainable."* However the processes suggested both in the World Water Commission report as well as in the " National Water Policy and Institutional Arrangements" in Sri Lanka are in fundamental violation of the above vision when they both propose that water should be converted to a "commodity" with " full cost pricing" in order to allow the private sector to utilize and manage (control) water for their profits.

Sarath Fernando

Secretary
Movement for National Land and Agricultural Reform (MONLAR)



WATER DIVINER

(The hazel wand detects water at its source in the hands of the water diviner)

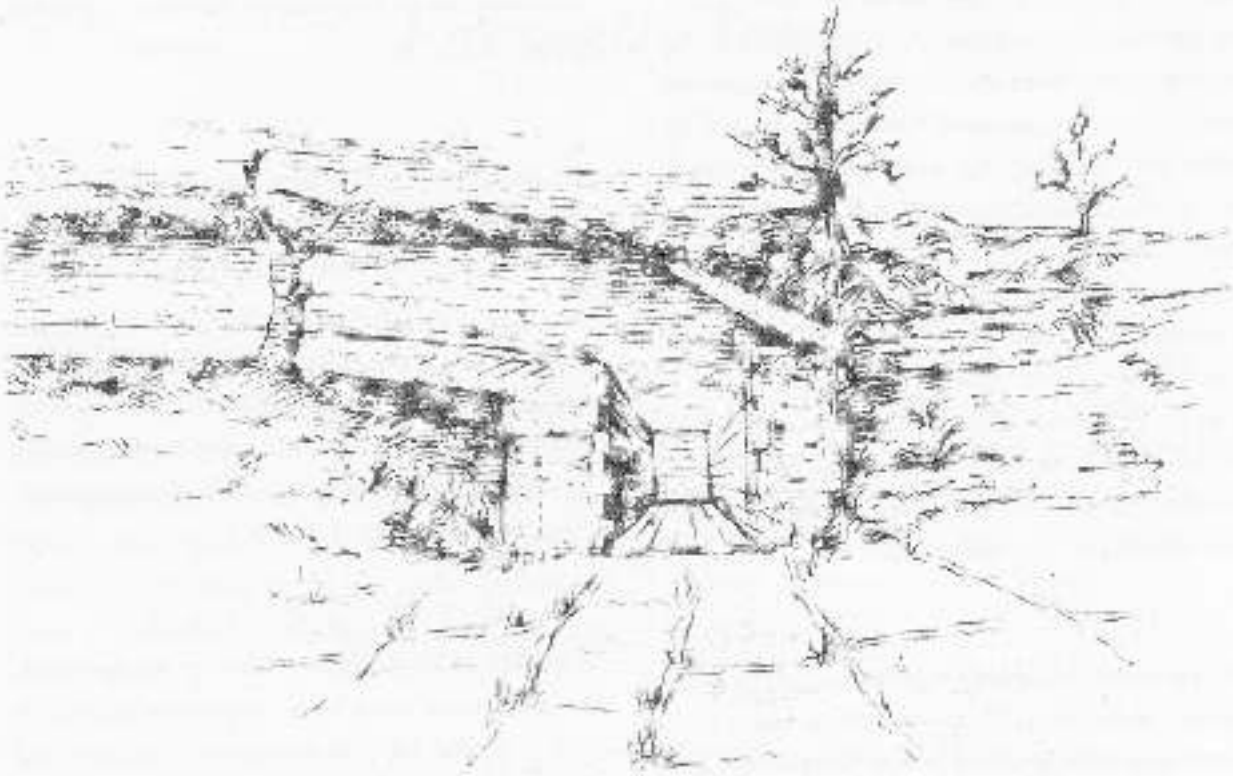
Water diviner,
walking over my
childhood on a sunsoaked
lawn the star tortoise hidden within the
flowerbeds.

The sun lights up the lilac tree
purple with birds and flowers.
selalhiris
stalk in the thick grass
where I leave
tentative footsteps in its dewfall.

The old tiles slope over my eyes
leaving me in shadow,
The windows peer at me
bars slender as fingers which I clasp
and yet I cannot free
my growing shadow
breathing everywhere I cast it,
A stranger walks
over the land
querying the earth and grass,
the twig quivers and dances
to its ritual response
in her white sunlit hands
crystal syllables of water
speak their rhetoric through
depths of rock,
our eyes distant from its source.

Water diviner
walks over my body's earth
on a sun-tortoised lawn searching a spring
I am yet to discover.

Jean Arasanayagam



Traditional Systems

When we consider the question of water, its uses, its importance to all living things including trees and plants it should be in the context of our historical past, looking back where ever possible to all those centuries when we lived and certainly used water.

There is one recorded drought in the Mahavamsa (*Samudra Saya*) other than that on the positive side it is clear that we enjoyed an abundance of paddy harvests even exporting it at times. The large number of ruined tanks bear testimony to a well worked out and established water preservation and distribution system. It included a flood control as well as supply method which provided the people with the necessary water.

This, much discussed and explored water management of our ancestors gives us a deep insight into their skills, knowledge and ability. In the words of Tennent "the technology was a perfect engineering feat". "The conduits by which the accumulated waters were distributed required to be constructed under the bed of the lake so that the egress should be certain and equal as long as any water remained in the tank. To effect this they were cut in many instances through solid granite and their ruins present singular illustrations of determined perseverance undeterred by the most discouraging difficulties and unrelieved by the slightest appliance of ingenuity to diminish the toil of excavation"

They met the drought and the no rain periods well equipped with rain water which came mostly with the two monsoons. Rainwater was collected in reservoirs made of mud embankments. One bund was over 17 million cubic yards and the water it held resembled a sea. A tank or wewa had a bund, a Biso Kotuwa, and sluices. Biso-Kotuwa, a rectangular enclosure regulated the water level, released it when necessary or stopped it. H. Parker writing on the Biso-Kotuwa says "yet the similarity of the design of the Biso-Kotuwa at all periods proves that the engineers of the third century B.C. if not those of an earlier period, had mastered the problem so successfully that all others were satisfied to copy their designs"

Thus the dry, arid and unfertile regions of the country were fed with water through canals, bunds, dams and anicuts and rain as well as waters of streams were controlled and water was distributed equally among the agricultural men and women; water was rarely unavailable. There were water sports and water festivals which declared the joy of living.

Were we the only people who thought of water management? Water is and was a basic need for all societies, for ecological soundness, social costs of development, scientific and technological knowledge base. All societies according to the terrain and the climate created ways of meeting the problem the need for water. The modernised methods are the use of dams, canals and tubewells. Water management builds up soil moisture, greater greenery, reduce soil and land erosion and maintain atmospheric humidity.

In India roof water harvesting in adopted. It also uses step wells, ponds and lakes (*Western India*). Tanks store water for as long a period as 18 months to two years.

Regarding dam technology, we can point out the earliest recorded dam on the Nile river dating about 2900 B.C. supplying water to Memphis.

Karikala built the Grand Anicut across the Kaveri in the 2nd century A. D. It is functioning even today. There are tanks in many parts of India with dams of smaller height. They have stood the test of time.

Water is a common property resource like the forest, the waste lands, grass lands and water collections. The ancients not only collected it carefully and managed it scientifically they also had a further collective process. "So careful were the inhabitants in husbanding the liquid resources on which their very existence depended that even the surplus water from one tank which would spill when water was plentiful were not allowed to escape. The tanks were built in orderly method at slightly varying elevations so that there often was a series of reservoirs to take the overflow from the one above it. The exit of water was regulated by means of sluices to the rice fields." R. L. Brohier in Ancient Irrigation Works in Ceylon Part 1.

From the past accounts of water management and systems used we see how our men and women developed our country and raised it to a glorious level of dignified existence.

E. R.

Factually Yours

Women make up half the population of the world, but they make up more than half of the poor and less priviedged - particularly in developing countries. Women play important roles in drinking water and sanitation. They are responsible for collecting water, washing clothes, cleaning kitchen equipment and preparing food. They do many of the day-to-day agricultural tasks. But they are excluded from water and sanitation programmes.

Issues concerning women cannot be considered in isolation. They are critical to the development of programmes.

In many countries, women are the main wage-earners and in urban slums, in particular, where water, food and fuel must be bought, the costs are high. In an increasing number of poor households it is women rather than the men who support the family.

It is also the women who take responsibility for health care in the home: for the elderly, the sick and the disabled, as well as for the children and men. It is women who prepare the food, fetch fuel and water and keep up the home.

Attitudes and beliefs about water and sanitation are sex-specific. In many countries of Asia and Africa, the excreta of men and women cannot be mixed. If a woman sees the excreta of a man she cannot be married. A daughter must not defaecate in the same place as her father, or a daughter-in-law in the same place as her father-in-law. In Latin America it is widely believed that women will become pregnant if they use the same latrines as men. In most industrialized countries there are laws that require public buildings to have separate facilities for women and men.

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Men and women have many common opinions on water quality. Decisions about acceptance often depend on smell, taste and colour. But it is primarily women who make choices about where to get water and how to use it. It is women's time, women's energy and women's convenience which are critical.

Why focus on women? Because women have a vital stake in water and sanitation. A women's focus does not call for a separate programme. Women's issues are very much part of what water and sanitation programmes are all about. A women's focus is needed if these programmes are to succeed.

Domestic work such as fetching water, cleaning clothes in rivers and ponds, washing utensils, handling food, is usually done by women. Women, therefore, come into greater and more frequent contact with contaminated water and are at greater risk of infection than men. Women also do agricultural work, such as transplanting rice seedlings, which involves standing in water for hours on end. Women can spend six hours

or more a day fetching and carrying water, a task which has health risks, especially when women are pregnant.

"Water work" adds to poor nutrition. Water carrying under normal circumstances uses up 12% of daytime energy. In dry and mountainous regions this may reach 25%. But water carrying should not be seen in isolation from the other work women do, nor from the fact that they are often likely to be pregnant or breast-feeding. Where fertility rates are high, women have on average six or eight live children and many more pregnancies. They may spend as much as eighteen years of their lives pregnant or breast-feeding. The energy needed during those periods is considerably higher that at other times.

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Improving the community water supply and sanitation is critical to the health of women in many different ways.

(Women, Water and Sanitation WHO)

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WATER DIVINER

(The hazel wand detects water at its source in the hands of the water diviner.)

...a stranger walks
over the land
        querying the earth and grass,
the twing quivers and dances
to its ritual response
in her white sunlit hands
        crystal syllables of water
        speak their rhetoric through
depths of rock,
our eyes distant from its source.

Water diviner
walks over my body's earth
on a sun-tortoised lawn searching a spring
I am yet to discover.

Jean Arasanayagam