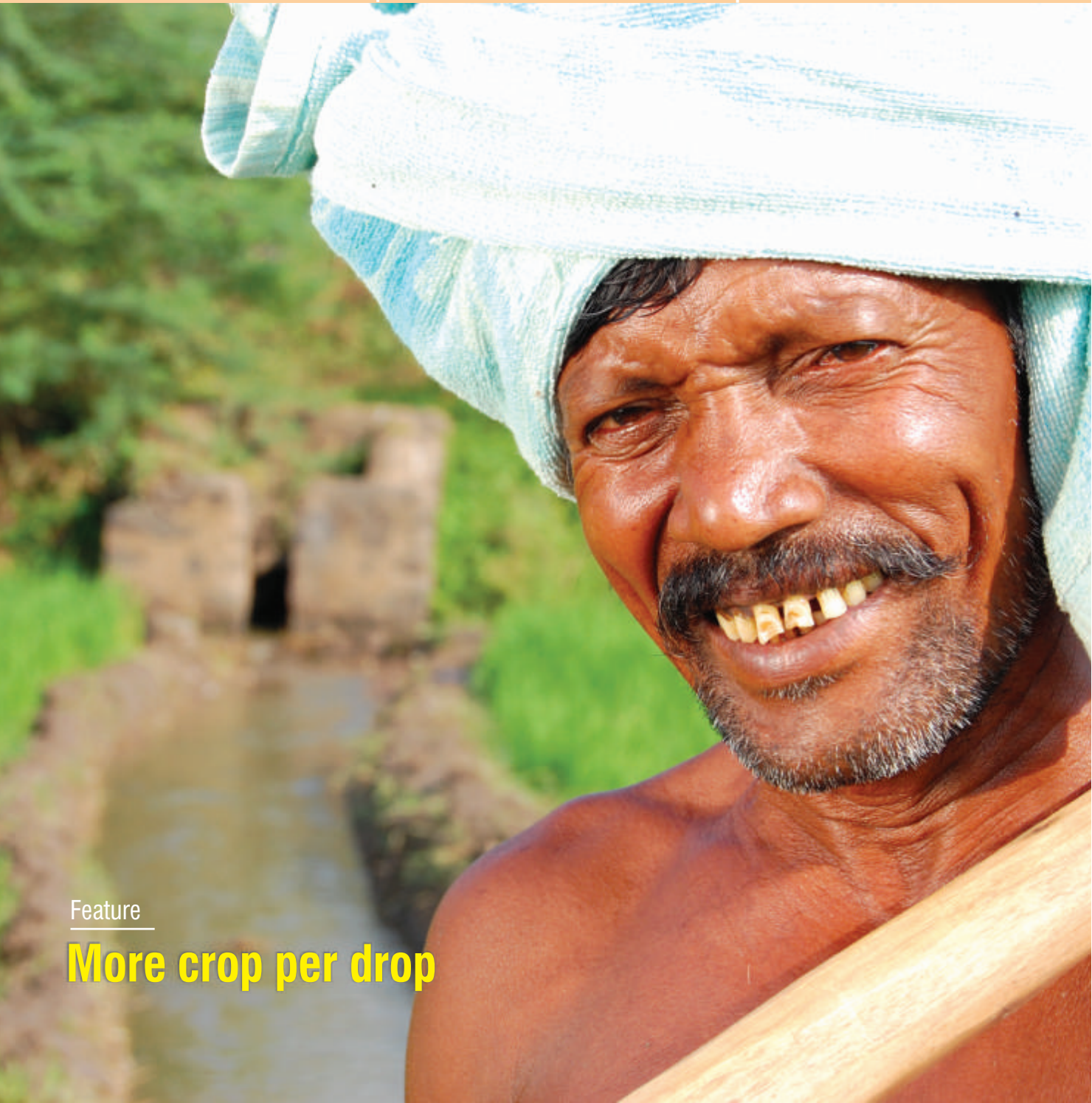
January 2008

Development Matters

Monthly Development update from DHAN Collective



Feature

More crop per drop

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Monthly Development update from DHAN Collective

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Adoption of a policy focusing on the enhancement of dynamic farming systems becomes critical for getting expected results.

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From the Editors' Desk

Dear Readers!

Thanks for your support in the making of Development Matters. Your feedback and comments are encouraging and we are seeing instant response from many of the DHANites whom we approach for article. This issue focuses on water. The focus article, 'More crop and income per drop of water' written by senior colleagues of Tank programme presents the opportunities for sustaining farming in the water scarce situations. Kanagavalli of Vayalagam programme writes on Vayalagam experience of Safe drinking water for poor households. An interview with M.P. Vasimalai by a team of Professors from IIMB on "An enabling model of community Development" speaks about the rich experience of DHAN in building sustainable models of Peoples' Institutions.

Devika from Vayalagam programme writes about urban water bodies of Madurai, she shares the works of CURE in renovating temple tanks of Madurai. Goetzenberger, Environmental Engineer from Germany, now volunteering for DHAN writes on what's going on in Madurai and the need of building awareness of waste water and sanitation in Madurai in specific and nation in general. Dr. Chandran, Lecturer, Thyagaraja College of Engineering writes how to reuse urban waste water. The issue also features the event "Maduari Marathon 2008, Run for Heritage water bodies". We expect your continued support by contributing articles, comments, critiques, feedback and encouragement to make this magazine a successful one.

Happy reading!

Contents

More crop per drop

Prof. C.R. Shanmugham, Er. Venkatasamy, Mr. A. Gurunathan*

Background

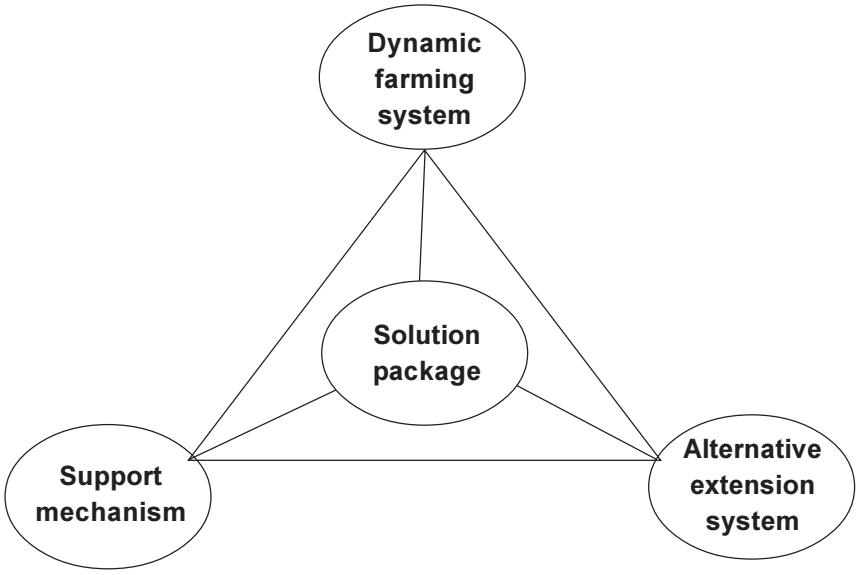
In India the current level of agricultural productivity, considering either the Unit area or the Unit quantity of water used, is very low when compared to many other countries. Ensuring food security for the growing population of a nation in a sustainable manner is the need of the hour. Soil and water resources and their management become very vital for ensuring food security. Many agricultural technologies remain un-adopted or have not reached the farmers for various reasons, including inadequate poor agricultural extension services. This article looks into the present problems and makes some suggestions for an implemental action plan, focusing on **More Crop and Income per Drop of water.**

Present Status

Presently many available agricultural technologies for enhancing agricultural productivity focus mainly on irrigated agriculture, while the adoptable technology with affordable cost for rainfed agriculture remains limited. It is because either the poor marginal and small farmers did not know the technology or they were constrained by the initial investment cost. The farmers are facing many difficulties in accessing agricultural credit from the formal credit institutions and more importantly the prices fixed for farm produce by the government are not compatible with production cost. The agriculture production practices adopted by the farming community are not market focused. The risks and vulnerability that the farmers undergo in farm sector have not been properly backed up with suitable risk mitigation solutions. In other words, the crop insurance options offered and the premiums prescribed by the insurance firms are not able to pull the large clientele into a suitable safety net. After the first green revolution, the focus of the government in nurturing farmers' need based research through the agricultural universities and research institutions have come down due to many reasons including limited funding support and conceptual understanding of research agencies on the different contexts and evolving research methodologies to provide sustainable solutions. The nature of the problems and their magnitude are not the same across the country and so also the solutions for the problems faced by the farming community in various parts of the country. Knowing well that agriculture is at the mercy of monsoons, there is a strong need to disseminate alternative livelihood options such as livestock rearing like goats, sheep, poultry, apiary, inland fishery etc.

Action plan for "More Crop and Income per Drop"- Conceptual Frame Work and suggestions

In the era of globalization and restrictions under World Trade Organisation (WTO), it is imperative for the government to introduce the concept and a practical strategy for increasing agricultural production. The conceptual frame work may broadly follow the following structure.



* **Prof. C.R. Shanmugham,** Programme Advisor; **Er. Venkatasamy,** Programme Office and **A .Gurunathan,** Programme Leader, DHAN Vayalagam (Tank) Foundation, Madurai.

Solution Packages

We propose the following conceptual solution package for the problems mentioned. Our views are expressed on the basis of acceptability to the farmers, adoptability for implementation and affordability both to the farmers and the government.

Re-orient investment pattern towards tankfed and rainfed agriculture: During most of the five year plans, importance was given for investments on Canal Irrigation and Well Irrigation sectors. But the incidence of poverty in the country is high among the small and marginal farmers who depend on dryland and tankfed agriculture, where there is a great scope for development. Hence there is an urgent need for the government to reorient its investment pattern towards them. The solution therefore has to come with specific area development approach for combining both the tankfed and rainfed agriculture. In south Indian context, Tank based watershed development undertaken on a contiguous basis in a sub-basin level will be a potential area for investment. This may be made with part grant and part long term loan-based investment.

A unique action plan focusing on surface water based lift irrigation programmes for North Indian Flood Plains: In states like Madhya Pradesh, Bihar, Chattisgarh, Jarkhand, Orissa and parts of Andhra Pradesh, there is untapped potential available to help the underprivileged farming community to adopt lift irrigation schemes across all surface water resources which remain unutilized at present.

Area/Context Specific Planning awaits a big push: The solution package varies with respect to area and context. Even though the country is divided into many agro-climatic regions, the schemes so far implemented by the government were taken up with a common approach. For instance, the coastal and tribal contexts need different solutions compared to conventional rural, and semi-urban contexts.

Coastal Agriculture: Coastal agriculture is the area that did not get adequate attention of the scientists. India having the longest coastline in South Asia has got a great opportunity to invest on coastal agriculture with salt tolerant varieties of crops and also revitalize the mangrove plantations. This in turn would minimize the exploitation of sea based bio-diversity by inland farmers as the wage labourers going for fishing.

Tribal Area Context: Tribal areas in the Country are endowed with great amount of natural resources that need development for effective utilization. This is because of high level of illiteracy and reluctance of government machinery and well planned schemes not reaching them. There is a huge exploitation of tribals by the traders in marketing the minor forest produce and purchasing the fertile lands at cheap costs. Development of road / transport communication and small inputs to harness with water resources can change the economy of hill areas remarkably.

Supporting Mechanisms

The solution packages have to be complemented the supporting mechanisms like Institutional Credit access without much of paper work and collaterals, affordable crop insurance to cover the weather based risks and implementation of Action Research programmes by the agricultural and allied research institutions based on farmers' needs. The role of NGOs and Voluntary Organisations has to form an integral part of facilitating these supporting mechanisms to the farmers with the agencies concerned and working on developing successful models in different contexts.

Promoting Effective Extension Services

The agriculture extension services have to be the most important component for achieving the objective of higher production. The present agricultural extension services available to the farmers remain either inadequate or ineffective. Therefore the government must look into promotion of effective extension services by involving the People, NGOs, Agricultural Universities /

Research Stations and Media. It is well known that the All India Radio played an important role in the first green revolution. So, we propose the following action plans for consideration.

- Mainstream Farm Field School Concept and creation of a demand system among farmers to pay for the services
- Operating an exclusive Television Channel for disseminating the agricultural technology and services offered by the government agencies and research institution to farmers.
- Establishing Plant Clinics at appropriate places for providing timely advice and inputs to the needy farmers
- Information Technology through Village Resource Centres or Internet Kiosks can play a key role in disseminating the best practices, counseling with agricultural experts, traders and farmers.

Dynamic Farming Systems

The farming system has undergone many changes over the years. It is not possible to stick to a single and straight jacket approach in evolving techniques to suit the needs of the farmers. Henceforth, adoption of a policy focusing on the enhancement of dynamic farming systems becomes critical for getting expected results.

Farm Ponds, Organic farming, Contract Farming, SRI methods are the buzz words in the modern agriculture towards conserving water and its efficient use for crop production.

The government always formulates very good plans, but they get diluted during implementation. The involvement of farming community from the planning to action and sustaining the initiatives are very essential in the present days. A multi-stakeholder approach comprising Community, NGO, Academia/Research Institutions, Financial institutions, and Government is very much needed to make the implementable action plans a resounding success. Above all, the action plan should be such that farming is made remunerative so that the farmers could gain confidence in adopting the techniques and technologies recommended with greater accountability.

Based on our field experience, a brief technical note for improving the Crop productivity is also furnished.

Brief Technical note on "More Crop and income per drop"

The following suggestions are made keeping in mind, mainly the small, marginal and medium farmers. Large farmers and corporates doing farming have their own advisors, consultants and scientists for increasing agricultural production and income. Therefore these recommendations may not be directly applicable to them.

Rainfall is the origin of all water resources. India with its annual average rainfall of 1215 mm, is adequately endowed with Nature's bounty. Only the high variability of the rainfall between the years and seasons cause anxiety, risk and often times, calamity to the farmers. It is the small farmers whose dependence on timely availability of water to grow crops is high and are therefore vulnerable to the changes in rainfall pattern. The vulnerability is even greater for rainfed farming cultivators.

More than 75 percent of the total available water is used for agriculture in our country. Compared to the use of water for agriculture in other tropical countries whose agro climatic conditions are similar to India or even more severe, there is a great scope to cut down our water utilization without any decline in productivity. For this to happen, we need to prevent wastage of available water on the one hand and harvest and conserve all the available rain water on the other. This can be achieved by carrying out watershed programme on a complete watershed or sub basin level and not in bits and pieces.

Soil moisture in crop root zone

Literature review indicates that on an average, about 34 percent of rainfall is stored as soil moisture in the root zone of crops in soil profile, while the rest goes as evaporation, runoff, and deep percolation to recharge the groundwater. But this quantum of stored soil moisture is not fully taken into consideration in any cropping plan or practice. This amount of soil moisture which constitutes about 400 mm is a substantial quantity, a major part of which is utilizable by the crops, if it can be conserved by the following soil and water conservation measures.

Methodology for conservation of soil moisture

1. Mulching with coir pith, soil mulch (through breaking down the capillary passages in the profile by shallow ploughing) and stubble mulching with crop residue or other similar methods.
2. In-situ moisture conservation can be attained by soil working and forming small basins, crescent or saucer shaped pits, and contour and staggered trenches in low

rainfall areas.

3. Conservation of optimum in-situ moisture and disposal of excess rain water is done through formation of contour or graded bunds, and field (compartment) bunds to harvest & trap the rain water within the field where it falls and disposal of excess rain water through waste weirs, contour stone walls, diversion drains, check dams, vegetative barriers and other similar structures in the other areas & fairly high sloping lands.
4. Planting tree seedlings of horticultural, green manure & other economic value in waste lands and along the boundary of crop lands as agro forestry.

Micro Irrigation

Installation of micro irrigation systems in lands having water facility from tanks, ponds and wells is another water saving activity providing high productivity. Both sophisticated sprinkler and drip irrigation systems for medium sized farms and economical & cost effective drip systems for land holdings as small as an acre or less are available in the market. These systems save irrigation water ranging from 40 to 65 percent of conventional surface irrigation water requirement and provide higher crop yield and lower labour input.

As the initial cost of installing the micro irrigation system is not within the means of small and marginal farmers, interest free credit facilities to the enterprising farmers who wish to install these systems, need to be provided through banks. One of the main difficulties faced by the farmers who wish to install micro irrigation system is the proper maintenance of the system which gets dysfunctional by clogging of the drippers, damage by birds, rats, squirrels & animals in search of drinking water, and trampling by people, animals & farm machinery. If arrangements are made to build the capacity of the farmers for proper maintenance & upkeep of these systems, they will gain confidence and become self reliant.

Instead of giving heavily subsidized rice under the PDS which inhibits the people to work and earn income; or free electricity for agriculture which results in over exploitation of ground water; and provision of the infrastructure facilities as suggested above will enthuse the farmers to increase the crop production with water savings.

Organic farming

Soil moisture conservation has a direct bearing on the amount of organic matter content in the soil. Farmers who successfully raise crops, incorporate organic matter from various sources (examples given below), which not only enriches the soil with plant nutrients but more importantly modifies the soil texture, improves the moisture holding capacity and encourages growth of earth worms and other micro organisms. Over the years these practices have resulted in sustained increase of crop production and low water requirement. Organic content of the soil is easily improved by green manure crop cultivation, green leaf manure application, application of cattle dung slurry from bio gas plants and the crop residues. Similarly mulching with degradable organic waste material not only minimizes evaporation of soil moisture but also arrests weed growth and prevents them from competing for water with the cultivated crop.

Integrated farming: Farming, when integrated with other allied enterprises like dry land horticulture, agro forestry, dairy, beekeeping, silk worm rearing and the like can produce more crop with less water and become sustainable without any external inputs.

"Sri" Technology: "Sri" technology provides high production with less seed and much less water.

Tank silt application: Tank silt application to the agricultural lands increases the fertility and modifies the texture of the soil to improve its water holding capacity, resulting in less frequent water application. This practice will incidentally encourage desilting tank beds & oorani beds and increase their storage capacity as well as ground water recharge potential.

Most of these water saving techniques are developed by scientists, researchers and academicians and are disseminated by Government departments. Several of them are being successfully practiced by some knowledgeable farmers over a period of time, but not by many others. As the population is increasing, food crop production has to correspondingly increase for our country to be self sufficient. But the demand for our limited water resources from sectors other than agriculture is increasing. Therefore it is felt that the emphasis hence forth should be on greater production with more efficient use of water. The suggestions made above are practically adoptable by any farmer, small or medium and require low cost inputs. The difficulties if any to practice them are easily surmountable. These practices give hope of stability and sustainability to profitable agriculture even for small and marginal farmers.

Safe drinking water for poor households

- Vayalagam experience

J. Kanagavalli*

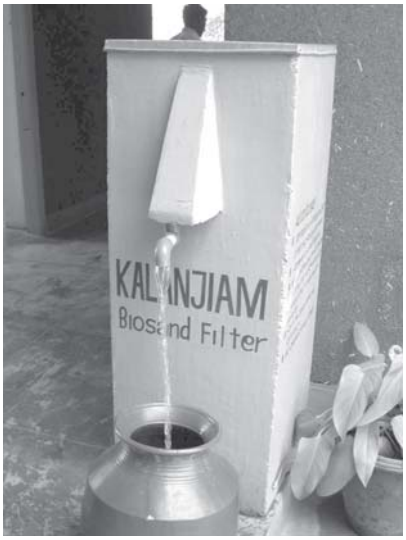
India has 16% of world's population but only 4% of the total available freshwater. The average annual precipitation in the country is 1170 mm, including snowfall of 4000 billion cubic meters (BCM). Out of this only 1123 BCM is assessed as the average annual and replenishable water – 690 BCM from surface water and 433 BCM from ground water. It is estimated that there are currently 19 million wells in the country, out of which 16 million are in use and are drawing about 231 BCM of water, 213 BCM for irrigation and 18 BCM for domestic and industrial use.

Quality of ground water in India

"Drinking water scarcity disturbs day-to-day life. Water and sanitation is one of the major causes for majority of diseases. More than 86% of the diseases in the country are directly or indirectly related to water for which at least 25-35% of family's income is drained towards health care expenses. India loses 90 million man days a year due to diseases, costing Rs.6 billion in production losses and treatment. It creates restlessness to the individuals particularly to the women and conflicts among the households, hamlets and the society as a whole. It affects the children's education too. There are cases of children carrying water pots in addition to their school bags. There are cases of girl children dropping out from schools to take care of their younger siblings while the mother goes to fetch drinking water from far off places.

Most of the drinking water schemes in rural and urban India depend on ground water. Tube wells or wells connected to pipes and hand pumps from shallow aquifers are the main sources. Apart from ground water, in many places people meet their minimum water requirements effectively by collecting rainwater locally in ponds. Ooranis (drinking water ponds) are the man made ponds that receives water from local streams & springs. They are considered to be a chief source of drinking water for the areas where the ground water is saline. It is estimated that 60 per cent of the country's population will live in urban areas by 2025. This will bring down the level of water percolation and increase runoff water in towns and cities due to reduced open spaces.

The ground water is contaminated due to many factors like geological formations which result in increasing trends in the levels of fluoride, arsenic and iron, through sewage entering into the ground. Particularly in urban areas, slum dwellers are more vulnerable to water-borne diseases such as cholera and typhoid due to sewage entering into the ground water. According to "Bharat Nirman Action Plan", there are 1, 93,813 hamlets affected by poor water quality. 220 million Indians do not have access to safe drinking water. India has the world's most densely



populated river basins, leading to high levels of bacterial contamination in surface water supplies. 80% of this pollution is from disease bearing human waste. In 1999, diarrhea alone killed over 700,000 Indians. About 30% of urban and 85% of rural households still depend on completely untreated surface or ground water.

Quality of drinking water

Drinking water quality can be defined by three broad categories – microbiological, chemical, and physical/aesthetic attributes. Microbiological contamination includes bacteria, viruses, protozoa, and helminths. Chemical contaminants can be organic or inorganic, from natural and/or anthropogenic sources. Physical or aesthetic contaminants can include turbidity, odor, taste, smell, and/or appearance. Of these three categories, microbiological and chemical

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contaminants are the most likely to affect human health, but physical or aesthetic contaminants are often easy to detect according to World Health Organisation (WHO).

Household water treatment and safe storage

Fecal contamination of source water as well as treated water is further exacerbated by the increasing population, urban growth and expansion, continued pollution of water bodies such as tanks, ponds, streams and rivers. Untreated sewage disposal into water bodies lead to pollution hazards in the fresh water ecosystems. The contamination of water while transporting and in the household presents high degree of health risks. For this segment of people, use of effective water treatment technologies and storage will have direct beneficial effect in the form of reduced infectious diseases and also contribute to the improved health and productivity. Affordable Household Water Treatment and Safe storage (HWTS) technologies can ensure these benefits. Affordability, sustainability and scalability are important issues in the adoption of household water treatment solutions.

Safe drinking water: an Imminent focus by DHAN

DHAN Foundation has been working on the theme of water conservation and management with community participation since 1992. DHAN's Tankfed Agriculture Development Programme now registered as "DHAN Vayalagam (Tank) Foundation" is working towards the conservation, development and management of natural resources for livelihood security and environment protection. As a part of this programme, DHAN implements watershed development programmes and safe drinking water programmes.

DHAN's experiences in rehabilitation of Ooranis, the available drinking water sources in three districts of Tamil Nadu have given a lot of insights to devise an affordable household water treatment model. The studies undertaken by DHAN on the relationship between poverty and health have shown that poor sanitation and unsafe water are the major causes for most of the illness and debt in the families, particularly in urban slums and rural areas. Safe drinking water can effectively tackle the issues of health and indebtedness. Household water treatment and safe storage can be an easy option for a poor family to address the health issues, minimize the leakages. It should be a simple, locally made, user-friendly and low cost solution for the poor families to get safe drinking water without spending much on it.

DHAN is now focusing on designing a replicable model for removal of microbial contamination from drinking water as it is the main cause of many of the diseases which could easily be prevented.

DHAN's initiatives

Household-level water treatment to remove one or more categories of drinking water contaminants is not a totally new phenomenon. Since ancient times, people employed different methods to improve quality of their drinking water. These methods include boiling, sedimentation, filtration, coagulation with alum, lime, and plant extracts, adsorption with charcoal, or exposure to germicidal metals such as silver and copper. Realizing the importance of providing safe drinking water and to bring about an improvement in the general quality of life in the poor communities, DHAN has decided to take up the house hold level water treatment techniques which can be easily adopted and affordable by the poor communities.

In order to intensify the activities to reach the scale, DHAN has entered into a Memorandum of Cooperation with Centre for Affordable Water and Sanitation Technology (CAWST) based at Calgary, Canada to establish a "Water Expertise and Training Centre (WETC)" mainly to create water literacy and a high level of awareness among various stake holders in the developing countries, especially in Asia and Africa. The WETC works with the objectives of reducing the incidence of water related diseases through water literacy, capacity building of the people on the need for safe drinking water, dissemination of experiences and best practices to promote their access to safe drinking water, research and documentation of various household water treatment options.

Types of filters

A variety of HWTS methods exist, but some of the most common treatment practices include Bio sand filters and Ceramic filters introduced among the communities on a pilot basis.

a. Bio sand filter

The Bio sand filter is a modified version of a slow sand filter made as a household utility. It was developed by a Canadian Engineer and Scientist Dr. David Manz and promoted by CAWST. It also provides technical training and consulting services. It acts as a catalyst to make water and sanitation projects a reality for the poorest of poor in the developing countries.

Bio sand filter technology

The Bio sand filter is a simple cement concrete box having six different distinct regions which involves removal of pathogens due to a combination of biological and mechanical processes. Organic material is trapped at the surface of the sand, forming a biological layer and over a period of one to three weeks, micro-organisms colonize this part of the filter. These micro-organisms consume bacteria and other pathogens found in the water, thereby providing highly effective water treatment. In addition to this process (known as predation), pathogens are removed due to their death and subsequent collection at the surface of the sand layer.

Viruses are adsorbed to the sand grains, which is metabolized by the cells or are inactivated by antiviral chemicals produced by the organisms in the filter. Cysts and worms are removed from the water by getting trapped in spaces which lie between the sand grains. A layer of water (5 cm deep) is maintained above the sand at all times. It is this design feature that distinguishes the Bio sand filter from other slow sand filters and which allows for both small scale construction and for intermittent use.

b. Ceramic filters

DHAN Foundation with the support of Water-for-life, a Netherlands based organisation, introduced pressurized ceramic filters; particularly in tsunami affected areas of Tamilnadu and Puducherry. About 500 units were distributed so far. The Stefani candles used in these filters are impregnated with colloidal silver which is more effective in removing the disease causing organisms. In pressurized candle filters, even though flow rate and the quality of filtered water was good in terms of removal of bacteria, there were other problems due to the pressure developed in the container and iron content in the water. It needs further research and development to standardize the technology. Hence it was decided to provide gravity filters rather than the pressurized candle filters.

DHAN's strategy

DHAN Foundation's role in introducing these technologies are social mobilization, education/ training, production and installation of filters/assembling of the filters and water quality monitoring.

Social mobilisation: Villages are identified with the help of professionals working in the Kalanjiam and Vayalagam programme locations. After selection of village, members interested in taking up this technology are identified by the user groups in the villages and they are oriented towards the importance of safe water before introducing the HWTS. Expansion of this programme has also happened in some areas through people to people dissemination of the information.

Community education/training: DHAN Foundation conducts different kinds of trainings and events with the view of creating mass awareness among various stakeholders like users, school children, community organizers, product manufactures. The content and duration of the trainings are decided based on the type of stake holders. These activities not only increase the awareness on the causes and effects of water borne diseases, but also the benefits of safe drinking water and good hygiene. DHAN has organised training programmes to other NGOs and educational institutions. It organized training to the members of COSI, a NGO based at Kandy, Sri Lanka. Apart from these more than 1000 beneficiaries were trained on the importance of safe water. In order to create awareness among the local community DHAN has made a film 'Kodangi' in Tamil highlighting the impact of safe drinking water. With the help of mobile theatre this film has been screened in about 100 villages in TamilNadu.

Installation of filters: Pilot demonstrations were done in few selected villages on both the types of filters and results were monitored closely to create pull effect among the users. Bio sand filters were built in five centers in Tamil Nadu. Local masons were trained on production of bio-sand filters with the objective of enhancing their skills, so that the filters can be manufactured locally based on the prescribed standard. The masons were identified from the families of user groups in the selected villages. The main purpose of selection among the member's family is that this training can give them an alternative livelihood opportunity in their own villages.

During implementation, the user may encounter problems related to operation and maintenance of a new technology. The programme has so far manufactured and distributed 1420 bio-sand filters to 90 villages in Tamil Nadu. In addition, with the support of Water-for-Life, The Netherlands, 10000 ceramic filters were given to 92 tsunami affected villages of Tamil Nadu.

***Water quality monitoring*:** Water quality at source as well as the user end is assessed periodically. Presence of *E-coli* (A bacterium that is commonly found in the lower intestine of warm-blooded animals and it is an ideal indicator organism to test environmental samples for fecal contamination) is assessed

periodically to monitor the efficiency of both types of filters and to suggest the improvements to be made on filter maintenance and storage using Oxfam Deluge Test Kit. Filters are inspected periodically and water samples are collected randomly. The results are again shared with the users. Water quality monitoring makes the users aware of the quality of water and increases their interest to take care of the filter maintenance.

***Resource support to other Agencies*:** South Asia pure water initiative Inc. from America, with the support of local NGO and Rotary club initiated a bio sand filter project in Kolar district of Karnataka. DHAN Foundation has supported in establishing a manufacturing facility by sending a technical person to train them. They have installed about 300 units. As a part of providing safe drinking water to children at schools, DHAN has trained the engineers and the staff of Sarva Shiksha Abhigyan (SSA) programme of Nellore district of Andhra Pradesh on the bio sand filter.

The impact

A survey was conducted to know the utility of both the filters. In case of Bio sand filters, it was found that the filters are fully acceptable to the users and they started realizing the benefit of safe drinking water. The experience of users in Rajakkalpatty village of Alanganallur block, S.Gopalapuram and Sengapadai villages of Tirumangalam block in Madurai district, and Pushpavanam village of Vedaranyam block in Nagapattinam district, showed that the quality of water from the filter was good and rice cooked with treated water was better in colour and taste, there was a very good impact on health of the users. Distinctively they mentioned that the incidence of cold and fever has come down, reduction of diarrhea, gastrointestinal and arthritic diseases which resulted in reduction in hospital expenses.

Learnings

One of the chief learning in introducing bio-sand filter technology was that the users need holistic understanding on the functioning of bio-sand technology. Formation of biological layer in the bio-sand filter takes one to three weeks and people do not have patience to wait till that period. It is important to give proper orientation to the users about the principles and technology. The process of restoring biological layer has to be done when people do not use the bio sand filter for more than two days. This will happen when the people go out of their villages for more than 2 to 3 days, filter becomes dysfunctional and the filtered water smells bad. On such occasions, top media needs (top 10 cms of sand) to be cleaned and it will take a few days for the reestablishment of biological layer. Apart from biological quality of water, certain other local issues like iron, fluoride etc also needs to be addressed. The other learning was production centers could be near the distribution location to minimize the damage caused during transportation to long distances. It is also important to ensure proper mix of cement concrete and its compaction during the construction of filters.

The learning from introducing ceramic candle technology was that the localized production and assembly distribution by the community will save the cost and a standardized and simplified design for operation and maintenance is required. The experiences of introducing ceramic candle filters have given scope for three areas for community management such as assembly, monitoring and technical service on their own to address the immediate local needs related to the filters. The issues identified for rectification were inadequate understanding among the women about operation and maintenance of the filter, where women have felt difficulty in pumping, white jelly formation, corrosion, oozing out of granulated activated carbon in filtered water, etc. Identifying the time of replacement of the candle is a challenge for local people.

Way Forward

HWTS is found to a good tool to create access to safe drinking water and better health for all, especially for the poor communities. From our experience it is evident that people believe the technology only after seeing the benefits. Until they realize the benefit, they need to be motivated to continue using the filters. This is possible only through proper orientation and intensive follow-up. So far, HWTS has reached a very small fraction of potential beneficiaries. We need to strengthen the network of people and establish collaboration with government agencies working in the drinking water projects to reach large scale adoption. DHAN Foundation through its WETC will intensify its work to make a sustainable impact on the health of the poor communities through creating access to safe drinking water at affordable cost. It is also found necessary to set up R&D to develop and test a few other types of water filters to cater to the needs of varying hydro-ecological conditions. ■

An enabling model of community development

Prof. Trilochan Sastry & Prof. R.Srinivasan*

Courtesy: IIMB Management Review, December 2007

Context of interview with M.P. Vasimalai, Founder-CEO, DHAN Foundation

DHAN Foundation has a unique 'enabling' model of development, creating community – based organisations that deliver services, rather than actually delivering services as many non-governmental organisations do. What will be of interest to corporate managers is the effectiveness of this business model. Vasimalai's definitions of top line and bottom line, and his understanding of how organisations founded by charismatic leaders need to institutionalize.

DHAN's founder and current CEO, Vasimalai, is a rare exception: a graduate of the Indian Institute of Management, Ahmedabad, who has spent his entire career after graduation with the development sector. He was one of the key people involved in setting up PRADAN in the 80s, and later set up the DHAN Foundation in 1997. The DHAN Foundation, headquartered in Madurai, Tamil Nadu, works on a number of themes including microfinance, tankfed agriculture, rainfed farming, and ICT. It has a unique enabling model of development that could be emulated by other non governmental organisations. In this interview with M.P.Vasimalai, Founder and CEO of DHAN Foundation, we seek to understand the logic of this model and its structure, processes and sustainability.

We often think of an NGO as small, amateurishly run and idealistic. In the case of DHAN we would be right about the idealism, but otherwise way off the mark. The DHAN Foundation works in several states with over 600,000 families from the poorest sections (and often from castes that have been historically discriminated against) of our society. A notable aspect of their work is that DHAN does not 'deliver' goods and services to these families, like say an FMCG firm. What it does instead is to help build community organisaiton owned and managed by these families. Such community organisations include primary groups of 15-20 members, clusters of several primary groups and federations of several clusters. These community organisations, and not DHAN, deliver services. Such an enabling model means that DHAN has to have the capabilities to build and nurture numerous organisations. Although this requires a much higher level of capability than if DHAN were a mere deliverer of services, this approach can significantly alter the lives of its members in about five years. What is perhaps more important is that these changes are long lasting and unlike other interventions we do not see people falling back into poverty.

The community organisations also act as a powerful demand system. For instance, the banking sector does not reach the poorest clients. The community organisations built by DHAN help channelise banking services to the clients. This is at much lower rates of interest – around 10% - compared to the more fashionable Micro Finance Institution (MFI) model that charges in excess of 30%.

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In other areas, the poor decide that water is their first priority and channel resources to revive local water bodies. The essence of a community based approach is that the poor decide what they would like to do for their own development. This is different from a corporate, MFI or government led service delivery approach where the poor are often recipients of 'cunning development programs' to use Amartya Sen's phrase. The task of an external enabler like DHAN is really to build such organisations. Decisions are then bottom up, demand driven; develop member's capabilities much better and foster participatory democracy. In the long run it also translates into higher incomes in a sustained manner.

There are many ideological debates on the efficacy of this approach. One is about the cost and effort required. Another is about the financial sustainability of this approach. There is also skepticism about whether this approach really works or not. The concept of social capital is usually invoked to argue that such an approach builds networks that help the poor to work out their problems more effectively. Building on this, the concept of social return on capital is perhaps useful. By this yardstick, the DHAN approach looks very attractive since not only does a community organization become independent within five years, but the social return on investment is also much greater than 200%. This is analogous to investment on subsidised education. DHAN has also demonstrated on a significant scale that this can be done.

Another debate is about the role of these organisations vis-à-vis the local Panchayat Raj Institutions (PRIs). Once argument is that PRIs have constitutional legitimacy whereas the community organisations do not, and they are taking over many functions of the PRIs. The fact however is that many of the poorest are largely ignored by the Panchayats. Hence community organisations like DHAN can play a useful role in correcting this imbalance. Perhaps the revival of the traditional *gram sabha* or general body, as opposed to the Panchayat, which is representative, will finesse this debate in the future.

An important key to DHAN's working is systems and processes that harness professional staff to work for the poor. It is all too easy for a professional to decide that s/he knows best. It is much more difficult for a professional to constantly re-think what s/he does in order to cater to the needs of the poor. This is in a way is good marketing. However, while the range of possible products a corporate organization has to be prepared to build community capacity to deliver whatever is uppermost in the community's mind.

Vasimalai believes that core values – also called the 'non negotiables' in DHAN – are critical. Although this is often seen in development organisations, many do not have a clear vision. What distinguishes DHAN and other successful large organisations is perhaps their clear vision, and the ability to translate those values into action. While values are non negotiable, the actual approach in the field is flexible and depends on the community's priorities. We could perhaps call it *value-based flexibility*.

Field experience from several other development organisations shows that a clearly articulated vision and 'walking the talk' when it comes to core values play a key role in attracting and retaining the right set of staff. A flexible approach not only gives freedom to the community, but also to the field staff . Perhaps success in the field and the positive feedback from the community sustains the motivation of the field staff. This set of issues needs further exploration.

A key issue for most NGOs is donor management. DHAN receives three levels of funding – project funding, programme funding and institutional funding. Vasimalai discusses how the organization handles each of these differently, networks with philanthropic organisations and plans to move towards bilateral initiatives with the government.

Keeping together a team of around 400 professional on low salaries for long years is not an easy task. The changing nature of leadership as an entrepreneurial startup organization grows, an issue that has long concerned researchers and practitioners, is as relevant for the development sector as for the corporate. Vasimalai provides a new perspective and a plausible structure to this concept. He also challenges the corporate view on what constitutes the top line and bottom line of organizational performance. For DHAN the bottom line is adherence to core values. We believe this view will give both managers and academics some valuable new insights into prioritisation in organisations.

An enabling model of community development: In conversation with M.P. Vasimalai

M.P. Vasimalai Founder and Executive Director, Development of Humane Action (DHAN) Foundation, a professional development organization. DHAN Foundation, which serves 600,000 families in India today, was initiated in 1987 with the objective of bringing hightly motivated and educated young women and men to the dev element sector to work on bringing out new innovations in rural development and for upscaling development interventions to eradicate poverty in vast areas of the country.

The Background

Ts/Rs: Can you give us some of the background on DHAN? Whom does DHAN work for? Do you have any focus areas or address the needs of any special groups?

MPV: DHAN works for the community, mainly the poor community. When we say poor community, it is the bottom of the pyramid, which is the poorest of the poor. We started working in rural areas and then moved to urban poverty and also to a the coastal and tribal areas. These are the four different contexts in which we operate. We are secular, and we have a special focus only on class- the economically poor.

DHAN strongly believes in building community institutions. Because many of the poor are unorganised, they don't operate as an effective demand system. When supply systems (eg. the banking system) are organised and the demand system is not working, there is an imperfect market operation. That is why it is important to organise the poor and the marginalised people to create an effective demand system. The first thing is ensuring entitlement. Although the government makes a lot of policies for this segment, there are several problems with the delivery.

For example, in the banking sector, 40 percent is reserved for the priority sector, but in fact the poor comprise only 8-10 percent of the priority sector, with agriculture and other sectors making up the rest. In order to ensure that this 10 percent goes to the right kind of people, we organise self –help Groups (SHGs) of up to 20 members, which serve as retailer to the bulk vendors (the banks), creating an effective demand system to interface with the supply system to make the whole thing work. That's how we ensure entitlement. Next, we build a viable working relationship between the demand and the supply systems, because it's not a one-time transaction – they have to work in tandem. The third stage, which is what we are actively working on now, is to make the demand system set the agenda for the supply system; where the villagers can go to the bank and say: these are the kind of things we want you to allocate for us. To reach that stage, we need to have a very effective demand system.

TS/RS : Why do they need these community organisations behind them? Can't they go to the banks as individuals?

MPV: Basically, the technologies of supply driven institutions are not class-neutral. Bankers have no incentive to reach out to the small people; to cut their transaction costs, they rely on campus banking rather than outreach banking. The number of people with bank accounts in this country is relatively small, and access to banks and other institutions is largely restricted to the advantaged classes, entrepreneurs and so on. In such a situation there is a need to organise the demand system. And a time will come when these people who are now accessing the bank in a group will graduate to opening bank accounts and become full-fledged customers.

The Approach

TS/RS : How do you build these community organisations?

MPV: The term 'community organisations' is a generic one; there is a whole range of functional groups. These functional groups operate on specific themes, such as water resources, health, education, information and communication technology (ICT), or microfinance. They really practice democracy; they sit together and take decisions, they don't depend on anyone else. However, it is not sufficient to have one functional group in operation. It's always better to have a set of functional groups, so that sharing and co-learning takes place. We call these cluster-development associations. Such associations also change the equations that exist between the panchayat and individual SHGs. The panchayat really looks at an SHG differently when it is a part of a whole range of nested functional groups, and the kinds of interactions that take place are more meaningful. Several clusters in turn form a federation.

TS/RS: What would be the size of a cluster or a federation in terms of members?

MPV: we aim for practical functionality – that is, the members should be within walking distance of each other. This usually means about four or five villages together, or sometimes, in the case of bigger villages, it could be just one. A cluster usually consists of 8-10 groups; not more than 10-15 groups. So the total number of members could be up to 250. Of course, the federation meetings are attended by only the leaders of these groups, because a federation runs into thousands of members. The maximum number is in Thirupati, which has 9,000 members. The smallest federation has around 2,000 members.

TS/RS: The government also forms village education and health committees, and so on. How is your approach different from that of the government?

MPV: The difference is in the processes. The government follows a blueprint. But they do not have processes to find out who really needs help, and what kind of help they need. Whereas we are talking about a kind of bottom-up process, where a lot more interaction takes place. Our people first go and spend time in the area in order to understand the lives of the poor, as well as find out who is really poor and who is not. We also train our people on how to interact and deal with the community. For example, when you go to the village, people will immediately bring you a chair and put you on a pedestal, but you should get out of that kind of stereotyping, and be comfortable enough to sit with the villagers on the floor. It takes three to six months for the first group to form. Once the first groups have been formed, and some kind of working processes are in place, people see the advantages and change begins to happen. Exposure is an excellent way of learning – people go there and see, they reflect on what is really relevant, and adapt the model to their own context and conditions. We call this an *extensionable*, as opposed to a *replicable*, model. We believe in characterising the context rather than in replicable models. Even the savings rate varies across different contexts. Such a process offers the people a lot of choices to come together as a group, as well as exit options.

TS/RS : What does DHAN Seek to achieve by promoting such organisations?

MPV: DHAN's main objective is to reduce and eradicate poverty. The second objective is fostering grassroots democracy. Grassroots democracy is not just rhetoric or an intellectual exercise. You need to have a space; you need to have a context and a theme. For instance, we have two main themes: the Kalanjiam Community Banking Programme, and the Vayalagam Tankfed Agriculture Development Programme. And once you provide this space, the people potential is really unleashed; and the way they respond is phenomenal.

TS/RS: You seem to avoid multi themed groups. Why is this, and how are the themes selected? Who selects them?

MPV: Some of the themes are really overarching themes, like microfinance. The theme itself provides the space for the poor to address their needs themselves; it gives them flexibility. For instance, if you give them money they can address education or health issues. We don't always fully understand the local situation, so the family or the community is the best judge of what it needs. What we do is to provide enablers and leave the choice to them. For instance, in many remote areas, drinking water is the greatest problem. Sometimes people have to walk miles to get water. Then their first choice is to start with a drinking water pond. Unlike some other MFIs, we don't specify what the money is for, or the duration. We leave it open and they take care of their needs by forming functional groups. These functional groups may include primary producer groups, producer companies and so on.

However, such groups can't operate in isolation for a long time. They have to be integrated in the totality of a framework. In these inclusive groups or gram sabhas, where different classes and interest groups have to work together, the dynamics are completely different. That's where governance, the village government steps in .

India has such a wealth of experience – go to any village and you can learn so much about relationships and governance, about managing different diversified groups, caste groups and working in harmony. I have not seen any intellectual or academic endeavours to understand these processes in depth. There is a rich mine here for researchers to explore.

TS/RS: Why, in your opinion, is this focus on community organisations not there to the extent one would hope for in the development sector as a whole?

MPV: The basic framework, with which we operate, the mindset, is very important. There has to be a regard for human dignity, we have to see that we are dealing with equals. I think the problem is that outsiders often think they know everything, and want to play a provider role. When you think you are going to give something, there is usually a gap between your perception and the reality of what those people actually need. But really it is very simple, very obvious. Take urban poverty. First you need to spend some money to organise the unorganised people. Once you organise them, allow them to flower, so many things come out on their own. But that kind of openness is rare because people think it will go out of their hands, or it will not be done the way they want or they don't understand what is happening….. a whole range of things.

TS/RS: What is the relationship between the community organisations and DHAN staff, particularly the staff who are in the field? How do they relate to community?

MPV: The DHAN Staff basically play a promotional role. They are not going to be there permanently, they are external. The governance aspect is taken care of by a decision making general body, and the executives (or community associates) who play a functional role. They also employ people, whom we support for the first three to four years with a honorarium. After that they are paid by the community itself. After five years, they even pay a professional salary.

We aim at promoting people's institutitions that will ultimately be self- managed and self-reliant. This is something not really understood well by the development community- everybody would like to put their own tag. But it is not a government's group or DHAN's group, it is a people's group. So the community needs to have its own identify. We try to bring a kind of branding or identity for the community, like Kalanjiam or Vayalagam. Kalanjiam is the name we have given to the cluster or federation of microfinance groups; each groups prefixes it with a name of its choice, like Kaliamman Kalanjiam or Mariammam Kalajiam. They relate with that and it has become a movement. The shared framework gives them a common identity.

TS/RS: You are working with more than 600,000 families, can you give us some examples of the kind of impact you have been able to create?

MPV: The concrete impact, in economic terms, can be seen in the rate at which people come out of poverty. In urban areas, they are out of poverty within three to five years; they have assets about twenty times what they started with. In rural areas, the effect is similar, but in the remote rural areas it takes a little longer. The opportunities are fewer, it takes a little more effort, but it is definitely doable within about 8-10 years. However, in the tribal areas, which are still in primary economies, they need 10 – 15 years. Here in DHAN Foundation, we believe a conservation approach pays, because there are a lot of leakages among the poor. We can achieve a lot if we start plugging these leakages.

Coming to the leadership aspect, thousand of leaders are coming up from the 6,81,000 rural households we work with. Initially there is a certain naïveté in the way they relate with the outside world, but they are refreshingly direct, eager to take voluntary responsibility and selfless in their work. And that also poses a challenge – keeping pace with them, sustaining our meaningfulness and relevance over a period of time. Over time, these leaders do make a change in themselves, the way they work, the way they demonstrate their commitment to the people, the value frameworks they develop and the way they take decisions. Often they get elected to the Panchayats and so on.

Another effect of the programme is that it serves as a mass adult education programme also. In these areas, for instance, communal and inter-caste clashes have reduced drastically. Around 40 – 60 percent of our members are scheduled caste the others are the poorest from other communities. In one village I visited in 1992, for a cluster meeting of about eight groups, it happened to be the turn of a low caste group to host the meeting. Another group, from a different caste, refused to eat there; the host group was very upset and we had to pacify them. But five years later, when I went back to the same village, it had become a non issue. Today, when we have a cluster meeting of mahasaba meeting of 4,000 or 5,000, al castes sit together. That's something we didn't really set out to do – it was an incidental benefit. It taught us that when you attack a particular issue, you want to change the whole world overnight, but people take time to mull over things and embrace change.

(The remaining part will be published in the February issue) ■

Urban Water Bodies of Madurai

R. Devika*

Madurai and Water bodies

Madurai is one of the oldest cities of Tamil Nadu, which is known for its cultural heritage and contribution to the Tamil literature. Being a Temple city, Madurai has a number of temples and temple tanks. These water bodies are grossly neglected due to various reasons. The issues of pollution are the common phenomenon in all the tanks. Many tanks are being used for discharging wastewater and dumping garbage. Many of these tanks have lost their connectivity with drainage system. As population grows, demand for water increases. So does the potential for pollution. Without realizing it, people waste water, pollute it or increase the amount of runoff. According to Madurai Corporation there are about 38 water bodies, among these 11 tanks have been put into other purposes like government buildings, bus stands etc. Protecting such historic assets left by our forefathers is everyone's business. Protecting water bodies such as tanks, ponds, supply channels and their watersheds are the need of the hour. It involves restoring to their original capacity, enhancing their performance and use.

Centre for Urban Water Resources (CURE)

Need for setting up a centre for studying the issues related to urban water bodies in and around Madurai city and for conserving them properly was felt by the Water theme of DHAN Foundation, Vayalagam Tankfed Agriculture Development Programme. It has promoted the centre called Centre for Urban Water Resources (CURE) with the objectives of renovating and reviving urban water resources, working with the communities on waste water treatment systems and safe drinking water. For this to happen, the centre collaborates with corporate, industries, community based organisations and the general public.

Study led to action

The centre made an exploratory study of all these water bodies. Most of them have been converted as sewage water bodies, open defecation was seen in all the tanks. These tanks were being used as solid wastes dumping yard. In variably all these tanks are facing the problem of encroachment by people and being converted into residential area. The inlet and outlet sources have been plugged and waterways have been disconnected due to encroachment. Hence there was no way for inflow of fresh water except the rainwater fall on the water spread area.

Through this study 35 temple tanks were identified and their situations were analysed. Based on the study, the CURE made presentation to the People Institution of DHAN, corporate bodies, and industrial houses to persuade them to adapt water bodies for revival. Three temple tanks out of 35 were selected for action by CURE viz. Thirupparankundram temple tank, Koodal Alagar temple tank and Immayil nanmai tharuvar kovil potramai kulam. The Immayil nanmai tharuvar kovil potramai kulam work was felt deserving immediate action based on the field observations. DHAN Foundation earmarked the contributions received during the Madurai Marathon 2007 to the tune of Rs.5 lakhs for carrying out the renovation works. Similarly works on Parasurampatti tank of Pudhur has been started with the financial support extended by the SBI Life.

***R. Devika,** Project Executive, Urban Water Bodies, CURE, Madurai.

Adoption of tanks by Kalanjiam Federations

Kalanjiam federations, who had participated in the Madurai Marathon 2007 pledged to adopt tanks. The Pothigai Vattara Kalanjiam has already initiated the steps for identification and resource mobilisation. Similarly the federations namely Gangai Vattara Kalanjiam, Sellur Kalanjia Vattaram, Pudhur Kalanjia Vattaram and Thenmadurai Vattara Kalanjiam would identify one tank each for renovation. They decided to raise at least Rs. 50,000 to take up works in each tank.

What needs to be done?

An ideal renovation scheme of a tank would involve works such as repairing the existing sluices with modern facility for easy operation, formation of islands for birds' sanctuary, construction of boating yard and boating arrangement, desilting of tank, providing necessary flood protection arrangements, formation of new bunds on the fore shore area, tree plantation, providing pumping room, construction of community toilets and establishing eco tourism

Similarly an ideal scheme of works for renovating water ways would include eviction of encroachment wherever possible, redesigning of the boundary, desilting of channels, lining, chair link fencing / lying of enter link blocks over bunds, online treatment of waste water, repairing the upper tank surplus channel, tree planting wherever possible.

Progress made so far

- Renovation of *"Immayil nanmai tharuvar kovil potramai kulam"* at a cost of Rs.1.35 lakh has already been initiated.

- Renovation of Kochadai supply channel, Parasurampatti tank, Chinna puliankulam tanks have been proposed to renovate at the estimate of Rs. 3 lakhs each would be taken up after getting 'No Objection Certificate (NoC)' from the State Water Resources Organisation (WRO).
- For all the above works, encroachment eviction process is in progress. All these tanks have been adopted by rural and urban Kalanjiam Federations.
- Bio sand filters have been distributed for 43 families on a pilot basis.
- A book titled "Tales of Temple Tanks" has been published and distributed to the public during the Madurai Marathon 2008 to create awareness about the importance of urban water bodies.
- The centre also persuaded Thiagarajar college of Engineering to adopt three tanks in Thiruparankundram, Fatima college to adopt Sellur, Tiruvapudaiyar kovil temple tank, Lady Doak college to adopt BiBi Kulam tank

Case of Immayil Nanmai tharuvar kovil - Porttamarai kulam

People treat the temple tank water as holy. Some times, they also use the tank water for bathing. The water in the Potramaraikulam belongs to Immayil Nanmai tharuvar kovil was earlier used for recharging the wells in the nearby areas. Now the tank recharges bore wells. The situation of the temple tank (Immayil Nanmai Tharuvar Tank) was ironically too pathetic and it got converted as a sewage tank. When we entered into the tank the bad odour deterred us from entering into it and it looked like a mosquito breeding ground. It was silted badly and filled with debris up to 10 feet. The tank had stagnated with the drainage coming out from the main temple. Nearly 2,000 litres of waste water discharged from the temple every day. In the festival days the volume increases. The cistern is connected to the temple and meet at common outlet and the water collected goes to the tank. For washing the cistern they are using caustic soda which also gets mixed with water.

DHAN Foundation has taken up this temple tank for renovation with the funds generated during Madurai Marathon 2007. Survey has been conduced and needed renovation were listed out. Excavation works and re-fixing of step which were in ruined form have been completed. ■

Fascinating Water Facts*

Water use facts

- Every 15 seconds, a child dies from a water-related disease.
- 1.8 million Children die each year from diarrhea – 4,900 deaths each day.
- 88 percent of all diseases are caused by unsafe drinking water, inadequate sanitation and poor hygiene.
- Asian rivers are the most polluted in the world, with three times as many bacteria from human waste as the global average. These rivers have 20 times more lead than those of industrialized countries.
- Indiscriminate sewage and industrial discharge. Asia's rivers average 20 times more lead than rivers in the industrialized world. It has 50 times more bacteria from human feces than the World Health Organization guidelines allow.
- At least 1 in 3 Asians has no access to safe drinking water, and at least 1 in 2 has no access to sanitation.
- Over 1.5 billion people lack ready access to drinking water and, if current consumption patterns continue, at least 3.5 billion people - nearly half the world's projected population - will live in water-stressed river basins in just 20 years.
- 1.1 billion people worldwide lack an adequate and safe supply of water for their daily needs, approximately one in five
- 5 million people mostly children die each year from illnesses caused by poor-quality water supplies
- Over the next 20 years, the average supply of world-wide water per person is expected to drop by a third.
- About 2 million tons of waste is dumped every day into rivers, lakes and streams. One liter of wastewater pollutes about eight liters of freshwater.
- Every day, 6000 people, mostly children under the age of five, die from diarrhoeal diseases due to worsening water quality.
- Poor people living in the slums often pay 5-10 times more for per liter of water than wealthy people living in the same city.
- The average toilet uses 23 to 33 litres of water per flush.
- A shower can use 114 to 227 litres (23 litres per minute)
- Just washing your hands can use up to 14 litres of water (with tap running at 14 litres per minute)
- Leaving the water running while you brush your teeth can waste 14 litres of water (at 14 litres per minute).
- Outdoor spigots can pump out 23 to 45 litres per minute.
- Automatic dishwashers use about 68 litres per load.
- Washing one load of clothes in an automatic washer uses about 205 litres.
- The average bath takes about 164 litres of water.
- The average individual uses about 568 litres of water per day.
- An average residence uses 4.86 lakhs litres of water per year.
- It takes 6819 litres of water to process 1 barrel of beer.
- It takes 1.77 lakhs litres of water to manufacture a new car, including tires.
- It takes about 36.36 lakhs litres of water to grow an acre of cotton.
- Forty five litres of water are needed to refine 4.54 litres of gasoline.
- Cutting one minute off your shower time can save about 3182 litres of water per month.
- A faucet that drips 60 times in one minute would waste over 14 litres a day, 5569 litres per year.
- A human can live more than a month without food but only as much as one week without water.

***Source:** http://www.h2o4u.org

Where's the Water

- 80 percent of the earth's surface is water
- 97 percent of the earth's water is seawater.
- 2 percent of the earth's water supply is locked in icecaps and glaciers.
- 1 percent of the earth's water is available for drinking.
- About 60 percent of the eight of the human body is water.
- An elephant is 70 percent water.
- A tomato is 95 percent water.
- An egg is about 74 percent water
- A watermelon is about 92 percent water
- A piece of lean meat is about 70 percent water.
- Fresh, uncompacted snow is usually 90-95 percent trapped air.

Physical Facts

- At sea-level pure water freezes into ice at 32 F (0 C)
- At sea-level pure water boils into steam at 212 F (100 C).
- Seawater freezes at about 28 F (-2 C)
- A cubic foot of water weighs 62.4 pounds.
- Seawater is usually about 3 1/2 percent heavier than fresh water because it contains about 35 pounds of salts in each 1,000 pounds of water.
- The pressure a mile down in the ocean is more than 2,300 pounds per square inch.
- Water expands by nearly one tenth of its volume when it freezes. 1 cubic foot of water becomes 1.09 cubic feet of ice.
- When a cubic foot of water at sea-level pressure boils away, it becomes about 1,700 cubic feet of steam.

Water cycle

- The water we use today is the same water the dinosaurs used.
- A fully grown oak tree may transpire about 380 liters of water a day. In summer an acre of corn transpires from 11,360 to 15,140 liters of water each day.
- Once evaporated, a water molecule spends ten days in the air.
- Every 24 hours about 250 cubic miles of water evaporates from the sea and the land.

Geography

- The earth's oceans cover about 140,500,000 square miles and contain almost 330,000,000 cubic miles of water.
- Scientists estimate that there may be enough ground-water in North America to cover the continent with a sheet of water almost 100 feet (30 meters) thick.
- The tallest waterfall in the world is Angel Falls (Venezuela) with a total drop of 3,212 feet (980m).
- River that carries most water in the world is the Amazon River (South America) which discharges about 4 million cubic feet every second into Atlantic Ocean. That's about 36.3 trillion litres per day!
- The longest river in the world is the Nile River (Africa) at 4,145 miles (6,670km).
- The world's shortest river is the Roe River in Montana at 201 feet long.
- The deepest and oldest lake in the world is Lake Baikal (Siberia) at 6,365 ft. (1,940 m) deep and 25 million years old Lake Baikal holds one-fifth of the earth's available fresh water.
- The largest ocean in the world is the Pacific Ocean at 64 million sq. miles (166 million sq. km)
- The world's largest (surface area) freshwater lake is Lake Superior (North America) with an area of 32,000 sq. miles (82,103 sq. km).
- Tutunendo, Columbia is the world's wettest place with an average rainfall of 463.4 inches (annual mean).
- The world's driest place is Desierto de Atacama (near Calma, Chile). It remained almost rainless for about 400 years (to 1971).

Pollution

- Four quarts of oil can cause an eight-acre oil slick if spilled or dumped down a storm sewer.
- One gram of 2,4-D (a common household herbicide) can contaminate 10 million liters of drinking water.

Building Awareness of Wastewater and Sanitation

J. Goetzenberger *

Introduction

DHAN Foundation in January 2008 inaugurated the new "Centre for Urban Water Resources (CURE)". CURE, located in S.S. Colony, belonging to the DHAN Vayalagam (Tank) Programme which concentrates on three fields of work: urban water bodies, safe drinking water, and wastewater and sanitation. Mr. Goetzenberger, a German environmental engineer and expert on decentralised wastewater treatment techniques, joined DHAN Foundation in September 2007 in order to support DHAN Foundation for two years in its efforts to start a programme focusing on wastewater and sanitation. Besides implementing technical solutions for decentralised wastewater treatment, CURE intends to build public awareness on wastewater and sanitation issues, and through this, show people how to handle wastewater in a safe way in order to minimize related health problems.

This article provides basic information on wastewater, the situation in Madurai and shows which problems are related to bad wastewater management. Recommendations are given, how everybody can contribute to minimize waste water generation, and through this, enhance everyone's living conditions better.

What's going on in Madurai?

Madurai is a place of great antiquity and historical importance. It has always been famous for its cultural and scholarly pursuits. It is one of the oldest cities in South and is said to be 2600 years old. However, with the rapidly increasing urbanisation, environmental problems arise and worsen. The city suffers in particular on tremendous problems related to wastewater and sanitation. Every day about 80 million litres of untreated wastewater (the volume of 32 Olympic-sized swimming pools) are routed into open water bodies and percolate into the ground.

Wastewater & sanitation

Wastewater is any clean water that has been adversely affected in quality by human intervention. Sanitation comprises the collection, transport, and treatment and (re) use of wastewater. Wastewater originates mainly from human waste (faeces, urine, cleansing water) and washing water (personal, clothes, dishes). It consists mainly of water (about 95%), pathogens (bacteria, viruses, worms), organic (faeces, hair, food) and inorganic (sand) particles and soluble organic material (pharmaceuticals, salt, sugar). Its chemical compounds are mainly hydrocarbons, nitrogen, phosphorus and potassium.

Sources of pollution

The generation of wastewater is normal and not preventable as the use of toilets and personal hygiene, kitchen use and clothes washing are necessary day-to-day activities. In India, one person uses daily about 135 litres of fresh water. In Madurai, 96 litres are supplied per person per day. About 80% of this ends up as wastewater, adding up to 100 million litres per day (MLD). Only about 59% of the Madurai population is covered under the existing underground sewer system, leading to about 40 MLD of wastewater routed directly into open water bodies every day. Out of the remaining collected wastewater, only 1/3 is pumped to the existing wastewater treatment systems due to insufficient capacities and poor performance. All in all, most of the generated wastewater is not properly collected or treated.

All over Madurai naturally channels originally meant to drain rainwater are transformed into open sewer systems. Rivers like Vaigai are polluted due to wastewater routed into them from all parts of the city. Urban and temple tanks are contaminated. To worsen the situation, channels, rivers and tanks are used by the public as open landfills, dumping and littering all kind of solid waste.

Problems linked to poor sanitation

A number of problems related to poor wastewater management exist in

* **J. Goetzenberger,** Programme Officer, Water and Sanitation, CURE.

Madurai and its surroundings and could be briefly discussed as follows:

Where no connection to an underground sewer system exists, greywater (washing water) and blackwater (contaminated with faeces) are routed from households into open channels or directly into rivers. Anaerobic degradation of organic compounds in the contaminated bodies leads to unpleasant nuisance through rotten odours. Flies are attracted and transmit diarrhoeal diseases when sitting on food afterwards. These open contaminations also act as breeding places for mosquitoes and other disease vectors leading to an enhanced risk and spread of malaria, dengue and other diseases.

In addition to the physical impacts, water-related diseases also have severe psychological consequences; e.g. the trauma of watching a young child dying from a preventable disease. Not to ignore, bad sanitation and related diseases lead to significant economic deficits of concerned persons, especially of the poor, as they lose valuable working time and education and by this get no chance to overcome poverty. Where wastewater reaches rivers, its use is enormously restrained. The water should not be used anymore for washing clothes or bathing as diseases will be transmitted. However, many residents have no choice – resulting in regular illness. Also the use of contaminated temple tanks for e.g. holy bathing purposes and urban tanks for e.g. agricultural irrigation is limited.

Improperly disposed wastewater percolates from open channels and water bodies into the ground, eventually polluting the groundwater. This bears the risk of contaminated drinking water delivered from downstream wells subsequently affecting users. Again, the poorest are the most affected due to lack of alternatives.

Wastewater pollution of rivers and tanks, beside restrictions of its users, also evokes further environmental problems: through the entry of nutrients contained in the wastewater, rivers and tanks get over-fertilised, resulting in augmented algae growth and finally in a collapsing ecosystem. Additional solid waste contaminations lead to disgusting sceneries, breeding grounds of disease vectors (flies, mosquitoes, cockroaches, rats) and provoke bad smells.

What and how to do better?

Wastewater is not preventable; however, quantity can be minimized and the disposal can be improved. By saving fresh water, the quantity of wastewater reduces accordingly. In order to save limited resources, save costs and finally relieve the environment, everybody should **reduce the personal consumption** as much as possible through e.g. closing the tap during brushing teeth, closing the shower during soaping, installing water saving toilets, using the cloth washer when completely filled, using rainwater for cleaning, irrigation, gardening, etc. Once the wastewater is generated, the major part has to be properly disposed, of course by the city authorities. An **underground sewer system** leading to functional and **adequate wastewater treatment** systems has to be provided in order to dispose and treat the polluted water. Upgrading the existing sewer system and construction of new treatment systems is currently planned by Madurai Corporation. But some areas, especially unauthorised settlements mainly slums, might not get

connected. Through **covering open channels** with concrete slabs or other suitable material, dwellers themselves can reduce odours and disturbance through insects and by reduced spreading of diseases.

Residents should take initiatives for **connecting houses to the sewer system,** if available, instead of draining wastewater into open channels or even building an individual septic tank to **avoid public contamination**. Dwellers, especially in the periphery, should **use (public) toilets** where available and **stop open defecation** as this leads to considerable health risks. Parents should be aware of the health risks related to wastewater and teach their children to **stay away from open channels and excreta** (open defecation). Water and wastewater issues and hygiene practices should be on the curriculum of all schools. Residents should act like an example for their children and **stop the vice of littering all kinds of solid waste**. By this, the cityscape can be enhanced easily and our as well as the following generations can live a more healthy life in a salubrious environment.

For any questions please feel free to contact

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Reuse of urban wastewater

Dr. S. Chandran*

Although water is very abundant on this earth, yet it is very precious. Out of the total water reserves of world, about 97% is salty water (marine) and only 3% is fresh water. Even this small fraction of fresh water is not available to us as most of it is concentrated up in polar ice caps and just 0.003% is readily available to us in the form of groundwater and surface water. Overuse of groundwater for drinking, irrigation and domestic purposes has resulted in rapid depletion of groundwater in various regions leading to lowering of water table and drying of wells. Pollution in many of the groundwater aquifers has made these wells unfit for consumption. Rivers and streams have long been used for discharging the wastes. Most of the civilizations have grown and flourished on the banks of rivers, but unfortunately, growth in turn, has been responsible for pollution of the rivers.

Water is a prime need for human survival and industrial development. So, demand on water resources for domestic, commercial, industrial and agricultural purposes is increasing significantly in the recent past. The situation is exacerbated by the growing urbanization. Many cities have fully exploited the readily available water resources and are now obliged to develop and treat sources of lower quality or reach long distances to develop new supplies, both expensive options. The need to conserve potable water supply has thus become an increasingly important part of urban and regional planning. As per the United Nations estimates (2002), at least 101 billion people do not even have access to safe drinking water and 2.4 billion do not have adequate sanitation facilities. Increasing population and expanding development would further increase the demands for wastes. It is estimated that by 2024, two – thirds of the world population would be suffering from acute water shortage.

Water and wastewater: An urban perspective

Cities throughout the developing world are growing at unprecedented rates. It is projected that 88% of one billion growths in global population by 2015 will take place in cities. Essentially all of it in developing countries after 2015, all worldwide growth in population is expected to decline 6% by 2050, while the global rural population should plateau at approximately 3.2 billion. The result is that after 2015, the worldwide growth in population will take place in cities of developing countries. The millennium development goals call for halving the proportion of people without access to improved sanitation or water by 2015. As a result, an additional 1.6 billion people will require access to a water supply- 1.018 billion in urban areas and 5.81 million in rural areas (WHO and UNICEF, 2000).

On the other hand, wastewater discharge into water sources is polluting to unacceptable levels. If water quality in the streams is to be maintained for the designated use, wastewater requires adequate treatment prior to disposal to prevent water quality degradation and to protect public health. Effective management of water resources and control of pollution are thus essential elements in sustainable development and human welfare. With many communities throughout the world approaching or reaching the limits of their available water supplies, water reclamation and reuse has become an attractive option for conserving and extending available water supplies to meet the current and future demands.

Tamil Nadu scenario

Tamil Nadu is among one of the most urbanized states in the country. Urbanization processes which accompany economic development have important implications for the allocation of water resources. Traditionally, water was used largely for agriculture and related uses. Drinking requirements were generally small. But the growth of cities, particularly metropolitan cities (population of 1 million or more) requires large allocation for water supply. For example, at a norm of 100 litres per capita per day, a city of more than a million such as Madurai would require treated drinking water of 100 to 150 million liters / day delivered to the user, net of losses in distribution, evaporation etc. Although these quantities may be small in relation to agriculture, the major problem that cities face is that local sources may be insufficient, and transport form long distances may be required. Also, drinking water is

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required throughout the year and not just for any particular season.

Both the National and State water policies consign drinking water as the highest priority. However, it is not clear how this allocation will be made in a given basin, where agricultural uses may already be committed. In such a "closed" basin, the criteria for reallocation are not spelt out. Should existing users be compensated for giving up their entitlements?

Improper disposal of sewage & safe drinking water

The other challenge posed by urbanization is pollution. Both domestic and industrial uses of water result in large quantities of wastewater which have to be disposed. When there is inadequate collection and treatment, the receiving water bodies like tanks, rivers, etc., get polluted. Pollution in turn could be detrimental to health, to ecosystems and in a variety of other ways. Water quality management thus becomes a key component of managing water resources. Institutions have been created to address these issues. Unfortunately, there is little coordination between the agencies responsible for water allocation and for water quality resulting in problems in many parts of Tamil Nadu. Wastewater systems in most cities / towns are at a very primitive level. Substantial investments are needed, which require financing of the capital costs and levying of user charges for cost recovery. There is gradual realization that the neglect of the wastewater side of the equation has very grim consequences in terms of public health, river water quality, tank degradation etc. The national **River Action Plan** has designated funding for wastewater system of cities / towns along major rivers. Water quality concerns remain outside the ambit of most of these institutions. Only the large municipal authorities who operate sewerage systems have the technical and managerial capacity to deal with wastewater. In many areas, septic tanks and open drainage systems for spillage (liquid waste from kitchen, bathroom and floor washing – except toilet waste) are commonly used resulting in pollution of waterways and water bodies.

The neglect of wastewater disposal and solid waste often results in the contamination of water. Waterborne diseases such as cholera, gastroenteritis, hepatitis, etc. as well as vector borne diseases such as malaria, filaria, and dengue fever are endemic in many cities / towns. The social costs in terms of treatment, absenteeism, reduced productivity, etc. can be very large. A study by the World Bank indicated that in India water contamination alone accounted for more than 60% of all the damages caused by pollution and environmental degradation. Discharge of sewage into lakes, tanks, etc. has also caused serious ecological problems e.g. Ooty and Kodaikanal, and Madurai lakes as well as many tanks and water bodies. Thus, the quality of the urban environment can be affected by discharge of wastewater or by over extraction of ground water.

Waste water irrigation – A simple solution

Wastewater reuse for agriculture presents not only a low cost appropriate disposal method but also an opportunity to manage wastes with minimum adverse environmental effects, as the treatment requirements prior to land application are less rigid than those for disposal into water bodies. The overriding consideration in developing a wastewater reuse system is the compatibility of the reclaimed water with its intended usage. Higher level uses, such as irrigation of public access lands or vegetables to be consumed without processing, require a higher level of wastewater treatment prior to reuse than lower level was such as pasture irrigation. When treated wastewater is used for agriculture and aquaculture, health impacts on farm workers as also bioaccumulation of heavy metals may lead to health hazards. Excessive hydraulic and nutrient loading poses the problem of water logging, salinisation, and excessive nitrate in the ground water. One of the best ways to dispose this wastewater is to recycle and reuse it. Although various treatment options are there before reuse, the money involved in the treatment of wastewater is huge which cannot be affordable by the developing countries like India. However, the reuse of wastewater for agricultural purposes requires minimum treatment or no treatment, which depends upon the quality of wastewater and type of crop to be cultivated. In many countries, use of untreated wastewater is being practiced over the years. Continuous usage of this wastewater causes both soil and ground water degradations. The rate and degree of contamination of this depend upon the quality of wastewater reused, type and profile of soil, type of crop, climatic conditions and method of irrigation.

Conclusion

Cities like Chennai and Madurai are chronically suffering for safe drinking water for its people. The situation is worsening year after year. In a place where water demand is steadily increasing, conservation becomes critical and essential. This means that preservation and protection of water bodies, increasing the artificial recharge & recycling and reuse of generated wastewaters all become important in the interest of providing assured fresh water supply.■

Saving Ooranis… Saving Lives

Kamalakannan*

Water is life

Water is the most vital, most deeply needed resource of our lives. No one can go through a day without any water to drink and wash. When there is in rarity, our very lives come to a standstill. Thousands of people in urban India are familiar with this struggle and cities simply do not have enough drinking water for its inhabitants. Thousands can speak from across cities, of the wait for the uncertain, dodgy once-in-three-days supply, long wait in the line for the water tanker, not enough water and the water fights. The scenario in villages is more disturbing as women and children walk miles in search of water.

Scarcity of drinking water

On an average an Indian woman **walks 3 - 4 hours daily** in search of drinking water.School going children are adversely affected because they are forced to **miss out their classes** in search of water. On an average an Indian woman **loses 45 mandays per year** in search of drinking water.

There are traditional water bodies serving the community for decades. But the erosion of traditional practices and unsure advances of modern conveniences has meant, most villagers have also forgotten the upkeep and maintenance of traditional water storage devices and water bodies, and suffer due to an often acute lack of water, chiefly drinking water.

From Tanks: To Oorani

DHAN's focus was on the tanks to renovate them and to bring back the farmer's management and thereby stabilize the livelihoods of the farmers depends on it. When we started our work in Ramanathapuram district and other drought prone district where ground water is saline and unfit for drinking, we realized the need of a sustainable safe drinking water sources in the region. The first Oorani (protected drinking water pond) was done in 1993 in a small village called Thattanendal. The intensity of work with the Ooranis began in mid nineties with the support of various development actors. DHAN Foundation has over the last 15 years taken up Oorani renovation work in collaboration with the District Rural Development Agencies, CAPART, Oxfam Novib, Department of Rural Development and other development agencies. In the last two years the support from individual donors and supporters for the cause of Ooranis helped us to reach to more villages in need.

Philanthropy for Ooranis

DHAN's Centre for Facilitating Philanthropy aims to create

*Kamalakannan, Project Executive, Centre for Facilitating Philanthropy, Madurai

opportunities for people and groups within India and abroad to meaningfully involve and contribute to development works. The experience has been highly encouraging and it has helped to set a platform to help the needy and share smiles among those in need. The Centre has been working on identifying various development needs and enabling the local community to take charge of the challenge to find solutions for it. "Support an Oorani" was the first initiative of the Centre, launched in July 2006 with the incredible support and encouragement from donors all over the globe. The project aims to ensure sustainable access to safe drinking water to the villages, where Ooranis are an appropriate solution.

Oorani Saves Ramnad, reflection from the people of Ramanathapuram.… *More than half of the life time of womenfolk' of Ramanathapuram district goes in searching and fetching drinking water. They walk long stretches to fetch a pot of water. Acute shortage of water makes the villagers to migrate permanently and their life becomes uncertain. Oorani secures its own position in providing permanent solution for the water scarcity. The life of a village rests with the Oorani. An Oorani with single filling can supply water for more than five villages and for more than a year even with continuous dry spell. It saves the time, money and manpower spent for water. Water is the elixir of life. Oorani is the sanctuary of water. It certainly helps save Ramnad.*

A village woman from Karuthaiyapuram village in Tuticorin District of Tamil Nadu says....*The drinking water Oorani is a long felt need in our village. Our village is around 3 km away from the main road to board a bus. My daughter who is studying 8th standard has to support me in fetching the water for drinking and domestic purpose before leaving to school. Many days it becomes difficult for her to catch the bus and to reach the school in time.*

The tribal people from Dhadonda village in Adilabad district of Andhra Pradesh say...*My village is situated in the top of the hill thus getting water during the summer is very difficult. We bring water using bullock cart. We have no other transport facility. We travel around four km to get water. Even I spent 8 to 12 hours per day to collect water to my home during summer. I know few people spend their entire night with torch light for getting few pots of drinking water. Getting drinking water is costing more than our lives here. We go to far way streams to fetch water where there is a risk of getting attacked by wild animals.*

Philanthropy for Ooranis: DHAN's experience

Ordinary people are reclaiming most of the *Oorani's* today. It therefore makes sense to reach out to the common man in India and abroad, and motivate them to contribute towards restoring and protecting these water bodies. Given that the world today has shrunk (thanks to the Internet and web-based banking), the people across the globe can be linked. The Centre for Facilitating Philanthropy intends to pursue this idea. The centre attracts people across the globe to join in this noble effort.

How can your support help?

A support of Rs.4,00,000 will revive an *Oorani,* This will save nearly 200 families from the crushing problem of water scarcity, For ever.

A support of Rs.2000 will provide drinking water security to a single family. But this can help in the long term only if an *Oorani* is revived or a new one created.

Philanthropy for Oorani: The Catalysts

This initiative established a network of "Friends of Ooranis" across the world. Mr. Ram Krishnan, a NRI from USA is passionate about two things - water and India. He took the initiative to mobilize support from individuals for the Oorani. The first Oorani was taken up at E-Velayuthapuram in Tuticorin district. Soon after that Ram became an ardent supporter of the Oorani. He then got a group of his friends and classmates from IIT, Madras to support an Oorani at Salur village in Kanchipuram district. He now coordinates "Rural India Learning Journey" wherein he organizes NRIs to visit various development initiatives going on in India and seeds the idea of giving back to the society. The first group who has visited Mudukulathur in December 2007 spontaneously adopted an Oorani for rehabilitation support.

D.V. Sridharan of goodnewsindia.com was the next to come under the spell of the Ooranis. He made a field visit and was deeply impressed by the approach of DHAN, the contribution by the community and

their commitment for its future maintenance. He saw it as an opportunity for the common man and anyone who cared about the environment and water to get involved in it. His encouragement helped us to host an exclusive web site for Oorani project. His article titled "water harvesting via the Internet" (http://www.goodnewsindia.com/index.php/Supplement/article/water-harvesting-via-the-internet/) exhorting his readers to get into action for the cause of water by supporting the cause of Ooranis and drinking water. Since then the goodnewsindia readers and others took up the cause of the Ooranis. His article has kindled the interest of the people around the world and attracted many well wishers to join hand with DHAN in this work.

Listen to Friends of Ooranis

Ms. Ramya Nageswaran from Singapore says…….. *"As a donor, I always look for projects where my contribution can make a lasting difference. I think donating for an Oorani fits this requirement to the T. An Oorani is a life changing and life giving addition to any village. Both men and women can work without worrying about collecting water, migration to cities in search of work goes down, children can study without walking long distances to fetch water or looking after the household chores when the mother is walking miles for water. Having adequate water provides the villagers with much more choices in their lives and also helps them to live a life with dignity."*

Huguenin Ralapalli Foundation (HRF) from California, USA says…….

People may be able to survive in this world with very little. But there is one thing essential to all, water – potable drinking water. That is why the Huguenin-Rallapalli Foundation (HRF) is so proud to fund the Oorani projects conceived by DHAN Foundation. Already, we are amazed with the expected results - millions of liters of safe and reliable drinking water within the reach of villages. In the Oorani project, DHAN is applying modern techniques to an ancient and traditional Indian idea of harvesting rain locally. HRF and DHAN are helping with the tools, but what makes this a success is the full involvement and commitment of the people living in the village to make the benefits from their Ooranis perpetual to their village.

Mr. Rajanandam and Sujatha Rajanandam from Ghana say…..*'As part of our endeavour to give back something to the community, we were looking for good developmental projects to contribute to. That's when we came across DHAN's Oorani project. We were impressed because it is addressing one of the basic needs i.e. water, in a traditional and simple way, instead of expensive, time consuming and controversial projects.*

Voices from the impacted Communities

Smt. Mariamma from Neerkundram in Ramanathapuram expresses ……..

I just remember the dreary days in my village before constructing our Oorani. I and my children used to travel 5-6 KMs in the morning in hot sun with bare foot to bring drinking water. Now my village is self sustainable in drinking water need and we are very happy that we saved our children and future generation from the crisis of drinking water scarcity. Now-a-days I am able to give a bath every day to my children and I get sufficient time for cooking and managing the works in home, since I need not travel and spend more time in search of drinking water now. Yes, this Oorani brought us out of drinking water indebtedness.

Mr. Periyaswamy the Vayalagam leader of Nediyamanikkam Oorani says ..... *In the absence of construction of this Oorani, we would have not been able to continue to live here. Our village would have been vacated and all of us would have forced to migrate to near by villages or to town. By extending support to construct this Oorani DHAN's Oorani project gave new lease of life to our village.*

Highlights as on 31 January 2008		
Number of Ooranis supported	:	19
Donor contribution mobilized so far	:	Rs.3,493,148
People contribution made so far	:	Rs.902,745
Work done so far	:	Rs.1,994,199
The Work Status		
Ooranis completed		E-Velayuthapuram, Viyasapuram, Nediyamanickam, Neerkundram, and Karuthaiahpuram,
Ooranis in the completion stage		Ulayiur, Nadukudiyurppu, Athanakurichi
Oorani in earth work stage		Kalugalasapuram, Dhadonda
Ooranis in Inlet/steps/draw well construction stage		N. Pethanendal, Parukkaikudi, Keelakanniseri, Samipatti, Thozhupethanendal and Salur
Ooranis in fencing stage		Kodarendal and Kamalapuram
Ooranis in Community mobilization stage and		Neerkoliyenthal, Andichiyenthal Senkottaipatti
Ooranis awaiting for funds Indira		Orivayal, Maruthanganalloor, Nagar and Saveriyarpattinam

Work progress

Since the launch of the Oorani pages on DHAN's website we have been able to get support for 19 Ooranis from 48 donors from seven countries (India, USA, Singapore, UAE, Ghana, Thailand and India). Several of them have provided repeat support for the Ooranis. Interestingly many of the donors took this cause close to their heart and extended repeated supports, and organized their friends to support this cause.

Way forward

Our experience in promoting philanthropy for the cause of drinking water has given us the confidence that when the community itself comes forward to resolve its problems there are Helping Hands around whom we can reach out.

You can also do it....

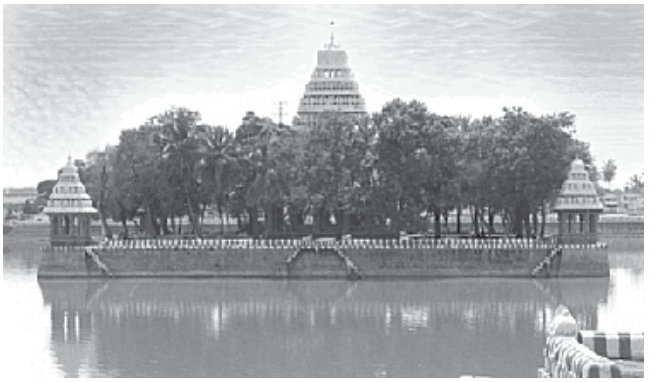
To help save the lives of the Life saving Ooranis

Kind hearted well-wishers can support an Oorani

Get in touch through,
cfpdhan@gmail.com

Read more about Oorani projects at
http://dhan.org/Ooranis/index.php

Run for Heritage Water Bodies: Madurai Marathon 2008



Madurai and Water Heritage

Madurai, the temple city of Tamil Nadu is rich in culture and heritage. It houses many tanks which serve as lifelines of the community for decades. In the era of urbanization and increasing population growth, Madurai is becoming one of the industrial hubs of Tamil Nadu. It poses biggest challenge to meet the increased water needs. On the other hand the recent decades witnessed a great decline in the quality of life saving water bodies. There is a lot more to water bodies than just the pleasant sight of brimming water. For centuries, water bodies were common properties that supported the community. Historically, kings, local chiefs and philanthropists developed and conserved these living heritages.

These heritage structures, which served the humanity for decades are now neglected and are being converted as drainage channels, garbage bins, and open toilets so on. It's the responsibility of every citizen to restore these ancient properties to serve for generations. The evidence of existence of Gruthmal River, once served the water needs of Madurai is found no more. Similarly many heritage water bodies including Vaigai River are losing their glories due to ignorance about the value of it.

Madurai Marathon

DHAN's Centre for Facilitating Philanthropy takes efforts to sensitize the society on community issues and find solutions for it. We firmly believe that sensitizing the community to own and preserve the water bodies would offer a long-term solution to today's daunting challenge of water scarcity.

Building a Public Private Partnership model to preserve and restore the water bodies is increasingly felt by all. It demands the participation of various stakeholders to join hands for this noble cause. The first Madurai Marathon was organized in 2007 on the theme of water. That attracted the attention of youth and public to refine and redefine the knowledge on water. Last year experience has brought greater focus and confidence to take the theme of water forward. It paved way for creation of water fund at people organizations.

The Gangai Vattara Kalanjiam, a federation of self help groups adopted the Puliankulam Chinna Kanmoi, wherein the SHG members have extended *shrmadan* (donating through physical work) to start demonstrating the need and importance of reviving the tank. The SBI Life, Kalanjia Iyyakkam and Vayalaga Iyyakkam's contribution for the cause of water helped to renovate the water bodies like Immayil Nanmai Tharuvar temple tank, etc. A Centre for Urban water Resources (CURE) has been established to act as a resource centre and for expanding the works on urban water bodies based on its need and importance.

Run for Heritage Water Bodies

DHAN Foundation organized the second Madurai Marathon on 13 January 2008. The event focused on bringing awareness and action related

to Heritage Water Bodies. The event was a marking one for Madurai with the support and active participation by various stakeholders of Madurai like Madurai Corporation, Corporates, NGOs, Academic institutions, people organisations and general public.

Cause dissemination was taken more intensively this year to reach the message to all the cross section of the society especially the youth for action. The cause related thematic essay and painting competitions were organized for the school and college students to kindle the knowledge on heritage water bodies. The academic institutions in and around Madurai actively participated in it. About 1041 students from 50 academic institutions have participated in the essay competitions. The essays were invited on six topics expressing the theme of Madurai Marathon 2008 *i.e.* Heritage Water Bodies. Mr. Krishna Kumar, Branch Head, Radio Mirchi presented the prizes for the district level winners with book gift vouchers and a certificate of appreciation. A drawing Competition was organized at district level at Fatima College on 06 January 2008. About 259 students from 66 schools and colleges participated and reflected their thoughts in the drawing competition. An artist panel led by Vc. T. Vijayan, finalized the prize winners. K. Sakthivel, Superintend Engineer presented the prizes for the winners of drawing competitions. The prize winning drawings and essays were displayed in an exhibition stall arranged on the Marathon day. The Kalanjia Iyyakkam sponsored the thematic competitions.

Water literacy campaign

A Water Literacy Programme was launched to spread the message on water and water bodies. The teachers from schools/colleges and public were trained by resource persons from DHAN People Academy. Training materials for use in reaching the message to the target group were given to the trained volunteers. The first Water Literacy Programme was conducted at the Madurai Corporation premises on 5th Jan 2008. About 121 teacher volunteers from 25 corporation schools participated in the event. S. Ramachandran, Deputy Commissioner of Madurai Corporation inaugurated the programme. All the corporation schools celebrated the "Water Awareness Week: January 7 – 14, 2008", herein students were sensitized to understand the issues involved in water bodies and the need for preserving them. Signage boards depicting the history and importance of the heritage water bodies were placed at 10 water bodies. The signage boards were prepared with the support of Heritage Consortium and the Centre for Urban water Resources (CURE). Madurai Corporation sponsored the signage boards as part of Jawaharlal Nehru National Urban Renewal Mission (JnNURM).

Marathon events

More than 22,000 people from all sections of the society participated in the various events organized as part of Madurai Marathon. The variety of events provided the participants space to run, walk or skate to highlight the cause of Heritage Water Bodies. There was a Half Marathon for about 21 kms for the athletes, a Mini Marathon from two different places for the youth and students, a Walk for a Cause to the general public and elders, a Walk for the Differently-Abled and a Roller Skating gave opportunity for all to join the effort. The events started from various points and finally converged at Madurai Medical College grounds. The marathon routes were designed in such a way that it touched important heritage water bodies in and around the Madurai city to give the participants a feel and bondage for the cause. The signage boards placed at the water bodies added to stimulate the interest of the participants and appreciate the heritage water bodies.

A "Half Marathon" for about 21 kms from Madurai Medical College was flagged off by Mr. K. Nandabalan, Commissioner of Police, Mr. B. T. Bangera, Managing Director, Hi Tech Arai, Mr. Manohar Devadoss, Artist and Author of book "Multiple Facets of My Madurai" and Ms. Nirmala Jeyaraj, Principal of Lady Doak College. Madurai District Athlete Association coordinated the event. The participants were provided with a certificate of participation and a T-shirt carrying the event logo and logo of Vayalaga Iyyakkam, the sponsor of the Half Marathon. Cash prizes were distributed to winners of first 10 places.

A "Roller Skating" run followed the Half Marathon, wherein skaters from various institutions participated in the event. Mr. Chokkalingam, Madurai District Skaters Association coordinated the event. The participants were provided with a cap and a certificate of participation. The event started at 7:15 am. Mr. K. Nandabalan, Commissioner of Police and Mr. B. T. Bangera, Managing Director of Hi Tech Arai Ltd flagged off the event.

A "Walk for the Differently Abled" was ogranised from Thallakulam Perumal Koil tank. People from 13

differently abled organizations participated in the event. Mr. Manohar Devadoss, Artist and Author of book "Multiple Facets of My Madurai" and Mr. C. Sundar, Chief Manager, State Bank of India flagged off the event. A musical troupe of visually challenged students from UPKAR, Madurai led the event participants to the venue.

The Mini Marathon started from two places namely Fatima College and Saravanapoigai (Thiruparankundram). Ms. Thenmozhi, Madurai Corporation Mayor, Mr. P.M. Mannan, Deputy Mayor, Mr. D.J. Dinakaran, Commissioner, Ms. Fatima Antony, Principal, Fatima College flagged off the event at Fatima College. Similarly the Mini Marathon from Saravanapoigai was flagged off by Mr. Abhai Kumar, Principal, Thiyagaraja College of Engineering. Students and youth from various academic institutions actively took part in the Mini Marathon. All the participants were provided with a cap and a certificate of participation.

A "Walk for a Cause" began from Mariamman Theppakulam. People from Kalanjiam and Vayalagam federations, employees of reputed business houses, government officials and members from various residents associations and general public participated in the walk for the cause. The participants were provided with a scarf. Mr. Ramamoorthi, Dean, Agriculture College and Research Institute, Madurai, Smt. Chinnapillai, Kalanjia Iyyakka Leader and Shri. Duraisamy, Vayalaga Iyyakka Leader flagged off the event.

There was an exhibition depicting the current year theme and the theme of the coming year. The Heritage Consortium arranged a stall on Heritage Water Bodies and the Kalanjiam Foundation arranged a stall on the theme of Aneamia. The Union Bank of India also arranged its stall at the venue. The certificates for the participants were distributed on the spot at the exhibition stalls.

The participants in all the events converged at the Medical College Grounds. The participants of each event excitingly shared their experiences. Everyone expressed that they felt proud to run for conserving heritage water bodies. D. J. Dinakaran, Madurai Corporation Commissioner; K. Sakthivel, Superintending Engineer; B.T. Bangera, Managing Director, Hi Tech Arai; M.P. Vasimalai, Executive Director, DHAN Foundation, Manohar

Devadoss, Artist; T. Srinivasan, Vice President (P&A), TVS, Prof. V. Abhai Kumar, Principal, Thiyagaraja College of Engineering; L. Krishna Kumar, Branch Head, Radio Mirchi, Prof. C.R. Shanmugham, Vayalagam Foundation, Bankkers and Academicians participated in the event.

Madurai Corporation, Kalanjia Iyyakkam, Vayalaga Iyyakkam, Hi Tech Arai, Union Bank of India, TVS, Canara Bank, State Bank of India, Indian Bank, Central Bank of India, ICICI, Indian Overseas Bank, HDFC, Ramraj Cottons, Rajmahal, Viswas Promoters, Humane Trust, Kalanjiam Tholizhagam Ltd. extended support for the conduct of the event. Appollo Hospital, Vikram Hospital and SUHUM Hospital provided the ambulance and health care services for the participants. The Latha Madhavan Polytechnic College, Fatima College, Madurai Kamaraj University and Thiyagaraja College of Engineering provided the volunteer support. Radio Mirchi and Taj Hotels provided the drinking water booths for the event. Radio Mirchi ran water literacy programmes and publicity prior to the event and also made live coverage of the event. All the dailies gave a good coverage of the event and highlighted the cause.

Tales of Madurai Temple Tanks

There were brief presentations by the Centre for Facilitating Philanthropy, Centre for Urban Water Resources, DHAN People Academy and Heritage Consortium. It oriented the participants to carry the message home. Voices of practitioners like Prof. C. R. Shunmugham, DHAN Vayalagam (Tank) Foundation, Ar. Balaji, and Er. Chandran, from Thyagaraja College of Engineering enriched the audience with content on heritage water bodies. Presence of Manohar Devadoss and his speech on Madurai Heritage and role of water bodies in it added flavour to the event. A book titled "Tales of Madurai Temple Tanks" from DHAN's Centre for Urban Water Resources was released during the occasion. The book presents about water quality and major concerns and cases of four temple tanks in Madurai City.

The Corporation Commissioner appreciated the initiative and he added that we have lost many water bodies due to the ignorance about its value and we cannot do much for the lost water bodies, whereas it is important to protect and conserve the remaining ponds. He called for a collective action by all the stakeholders including general public, corporates, industrial houses and academic institutions in protecting such water bodies.

Patronage for water bodies

It was a pioneering effort and a memorable moment when the Kalanjiam and Vayalagam people organisations, corporates like TVS and academic institutions such as Fatima College, Lady Doak College, Thyagaraja College of Engineering came forward on the stage and declared adoption of water bodies in Madurai. D. J. Dinakaran and M. P. Vasimalai called for the role of public and private partnerships in taking this initiative forward.

Theme for Marathon 2009

The theme for the Madurai Marathon 2009 has been declared as "Run for Anemia free world". A year long campaign for preventing anemia would be organised that would confluence at the Marathon to be organised in 2009.

Building on Heritage *of* Collective action

Kudimaramath *refers to the traditional system of tank management widely practiced before independence.* ***Kudi*** *means the villagers,* ***maramath*** *means maintenance work. A village elder, assisted by a committee, would coordinate and motivate the local community to maintain the irrigation structures. Villagers provide their labour freely.*

Water unites Communities

The customary water rights enjoyed by community were indeed gained by them due to their hard work in construction as well as in maintenance. The stone inscriptions found on some of the age old tanks throw light on public participation in maintenance and renovation. The communities followed a unique system of Kudimaramath where each family would contribute their labour for the repair and maintenance works. But after the introduction of Ryotwari settlements by the middle of 19th century, the effectiveness of the traditional system deteriorated progressively, resulted in decay of local management. The Vayalagam tank farmers' organisations ensure Kudimaramath in all the conservation works taken up by them.

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