# SLAKING THIRST – RETREIVING DESERTIFIED LIVING SPACES: The Developmental Agenda for the Millennium

*-Crispino Lobo and Abraham Samuel*

*August 2001*

It is a problem that spans all continents, affects all nations and impacts upon the lives and livelihoods of communities everywhere in the world. The problem of access to water and to productive habitable living spaces. This indeed is the challenge of the millennium. Availability of water as well as hospitable life and livelihood supporting environments is declining rapidly all over the world.

While in the past, wars took place for territorial or political gain access to natural resources – (mineral resources, particularly) and markets, the wars of the future are increasingly going to be based around access to water as well as supporting habitable and productive environments. This is fairly evident from the large number of conflicts that are taking place in several parts of the world.

Impounding, conservation, management and utilization of water and natural resources are becoming hot spots and the source of wars, conflict and bitter dispute. Large scale migrations from rural to urban or better endowed areas is largely the result of increasing pauperization and immiserization resulting from drought, reducing water availability, excessive pressure on land and contraction in the capacity of the productive base of rural economies to support a minimally reasonable quality of life. This leads in turn to social dislocation, alienation, lack of adequate integration, conflict over scarce resources, development of slums and all the attendant social upheavals and conflicts that such a desiccating or degrading process ensures.

The developmental agenda then, for most, if not all developing countries, wherein poverty constitutes a major challenge, is to ensure access to sufficient quantities of water for domestic, industrial and agricultural purposes, as well as

to conserve and enhance the productive bases of rural environments so as to provide not only livelihood security and alternatives, but also food security. Thus, how we trap, conserve and utilize rainwater as well as how we manage our environments is going to set the social agenda of large swathes of society in developing countries in the coming millennium.

The conventional way of responding to such a situation is to undertake measures or means which, instead of mobilizing resources, i.e. conserving and utilizing them in a manner that is sustainable, lead to further extraction and exploitation, thus resulting in a net depletion of resources. While some problems are addressed, new ones are created and the net result is that the problem of the majority are hardly addressed. Take for instance the response of planners towards a water crisis. The immediate reaction is to build a dam. While this may solve some problems, like increasing flows of water to urban, industrial or agricultural areas, it causes major problems in the catchment area in terms of submersion, displacements as well as loss of bio-diversity. It also adversely affects downstream traditional water users, who, while previously enjoying unrestricted access, who now have to contend with greatly diminished or non-existent flows.

Furthermore, even if one were to accept this as a legitimate response, notwithstanding the associated problems (often of a cruel and inhuman kind when one considers the abysmal record on rehabilitation and the resultant fate of the ousted and conflicts that arise, such a response is highly specific to the hydrological flows as well as to geographical locations. It is not a response that can be widely implemented across a region or a country experiencing water shortages. In India for instance, it is estimated, that if all the rivers were dammed and all the potential fully exploited, one could not irrigate more than 30% of the arable land, thus leaving 70% beyond the application of such a technology.

The same is true of the environment. It is generally believed that between 30-33% of the landmass should be under green cover. One way of responding to such a need is to reserve areas and afforest them. While this would meet such a target, it really wouldn't benefit the vast majority of people living in other areas, which are usually barren and degraded. The direct and immediate benefits of such afforestation would accrue to communities living within the vicinity of such a green zone and nowhere else. Hence a more appropriate response would be to develop such green zones on a decentralized basis, wherever human communities are living and drawing sustenance from the environment.

Hence the need of the hour is to develop strategies that are aimed at conserving, mobilizing, managing and utilizing rain water as well as the environment in a manner that is decentralized, spread across large areas and within the control, purview, understanding and ownership of local communities. Technically sophisticated interventions like building dams to impound water, or the raising of massive green belts require the intervention of specialized agencies, intensive inputs, professional maintenance and substantial resources for operations as well as management. Besides, while solving to an extent the problems of a particular locale, they do not remotely address similar problems affecting a far greater number of people and communities elsewhere. Decentralized solutions not only address to a large extent the problem but are also manageable and maintainable by local communities themselves. These are therefore sustainable and do not require high inputs and resources to either develop or operate.

One such large scale attempt at conserving rainwater over large areas as well as retrieving inhospitable and desertified rural living spaces in a manner that regenerates the environment as well as meets the basic needs of the community living within these spaces is being made in the western Indian State of Maharashtra (capital Mumbai). The approach being followed is called participatory watershed development, wherein rainwater is sought to be trapped

as and where it falls, in such a manner that running water is made to flow slowly, slowly moving water is stopped and standing water is allowed to percolate to recharge the soil and groundwater aquifers. Such impounding is done not only along the drainage lines, but across the entire landmass. It is water impounding in a decentralized manner along watershed lines.

A watershed can be defined as the catchment area, of a particular drainage system. As rain falls, it gushes down the hills, along sloping lands. It collects into rills, rivulets, gullies, into streamlets and brooks as the water rushes down and finally gathers into streams and rivers. This entire area that feeds water into drainage channels is called a watershed.

Watershed Development, while focused on augmenting water resources and regenerating the environment, seeks to bring about an optimal and judicious balance between the productive capabilities of natural resources and the ecology on the one hand, and the claims made upon it by the human community as well as animals, both domestic and wild on the other. Thus watershed development involves the application of a variety of measures, namely, mechanical, vegetative and hydraulic, as well as the development and operationalisation of institutional fora and mechanisms that enable a community to initiate, implement, and maintain environmentally sound interventions. In other words, a process has to be initiated that is not technical in nature, but primarily social and institutional, which enables a community to discover the potential its environmental offers in terms of enhancing the quality of its life. It should then lead them to define and implement measures that enable it to not only meet present needs but also secure the future in a manner that all benefit and thus acquire a stake in the maintenance and proper management of created and generated resources. For, unless a process is engendered that fosters and secures participation and ownership, such an effort is not only not possible, but, even if initiated, will not sustain itself and thus fail to deliver on its potential.

Simply put, watershed development consists of the following components:

1. *Community mobilization and organization*

2. *Area treatments or land based treatments:* These are in the nature of soil conservation measures. Since a cardinal principle in watershed development is to follow the water, work must necessarily start from the ridgeline down the hillsides and into the valleys. A ridge-to-valley principle must be followed. Such mechanical measures, which are land-based and which begin from the ridgeline, would involve the establishment of continuous contour trenches (CCTs) which help to break the flow of water and water absorption trenches (WATs) in areas of heavier rainfall. As one comes down one establishes contour bunds (CBs) and farm bunds (FB) with the necessary water surplusing arrangements

3. *Drainage line treatments:* Such treatments are undertaken on the various rills, brooks, streamlets and streams. Beginning from the top, they consist of simple structures like gully plugs which are nothing but a collection of stones placed across such water courses. As one comes lower, one builds brush-wood check dams, earthen structures across the rivers (called nalla bunds), Gabion structures and lower down in the drainage course, one builds check dams and percolation tanks. A Percolation tank is large storage tank of surplus water which seeks to impound water in a manner that enables it to percolate. It is not used for purposes of direct irrigation.

4. *Vegetative and biomass development:* This involves the development of pastures as well as forests or wood lots. It also includes the stabilization of earthen and mechanical structures as well as minor hydraulic structures through plantation of grasses and other shrubs on these structures.

5. *Changes in land use patterns according to land capability:* As a result of better soil moisture regime and greater availability of water resulting from the above

mentioned measures, it is possible to change the cropping pattern and to diversify it, so as to not only accommodate the need for additional income, but to also widen nutrition possibilities, accommodate market fluctuations and as well as unexpected rainfall variability. One can also diversify the agricultural pattern by developing horticulture and other agro-related activities like livestock development such as homestead poultry, goateries, piggeries as well as milch cattle. Where standing water bodies are created, pisciculture can be initiated.

Thus we see that participatory watershed development addresses not only the need for water, stabilization and enhancement of livelihood and food security but, in the process, and this is particularly important, it catalyses the creative forces and potential within a community.

Poverty is often the result, not only of a poor environment, but also of inadequate and fractured social organisation. It is an observed fact that people living in degraded areas are also people who are poor, exposed to considerable hardships and living individualized and atomized lives. The sense of community and social organisation is often rather poor. Healthy, robust and well managed environments, on the other hand, often reflect a higher quality of life of the people and also a greater sense of social harmony as well as organisation. The social capital in such communities is usually much more than that existing in poorer communities living in desertified barren lands, reduced to a subsistence level of living.

Participatory watershed development enables a community to come together, to find strength within and to tap its collective wisdom, energy, competencies and skills. It greatly aids the formation of human as well as social capital, creates hope, energy, spurs initiative and self help. At the same time it fosters the creation of robust and effective mechanisms of debate, transparency, accountability, conflict resolution and sharing of benefits and resources. These

are vital ingredients without which no individual or community can ever hope to break the spiral of poverty and take definitive steps towards enhancing the quality of life, acquiring capabilities and skills to access and build on opportunities for further growth and development. If this effort is augmented by the development of infrastructure such as roads, electricity, telecommunications as well as linkage to markets, financial institutions and the provision of health and educational facilities, it is possible, not only to enhance considerably the quality of life of rural inhabitants, but also ensure development and growth in a decentralized manner, thus obviating the need of people to migrate to urban as well as industrial centres. This would, additionally, reduce regional disparities and imbalances as well as the unequal flow of resources and unequal terms of trade.

Maharashtra, is a west Indian littoral State having a population of around 90 million people and a geographical area of 307,690 sq. km. Except for the coastal belt and the eastern part of the State the vast hinterland suffers from very scanty to average rainfall. The rainfall in this belt ranges from 150 mm to about 800 mm and this area occupies about 70% of the State. It is also this area which experiences droughts on a regular basis and in recent years has been experiencing acute water shortages annually. A decade ago about 6000 villages out of a total amount of 40000 would experience water shortages during summer. Today that number has gone up to over 20000 villages, which means half the villages in the State. In practically all these villages not only have water sources dried up, but the environment itself has become greatly degraded and severely stressed. Every year these areas experience migrations of large numbers of rural people to either urban or irrigated areas in search of livelihood and a better quality of life. Some of this is seasonal and the rest permanent. If the rate of urbanization is any indication, it appears that such migration is increasingly becoming permanent. Thus, this vast hinterland can be described as fragile, desertified and becoming increasingly inhospitable.

In 1972, a severe drought ravaged Maharashtra. Large scale distress migration, severe disruption in the social economic life and livelihoods took place in rural areas. This drought, however, prompted the government and other agencies in the State, particularly voluntary agencies to explore the reasons that led to such major upheavals and to find ways to address them. While formerly, drought or shortage of drinking water would have led to immediate spudding of wells or the clamour for erecting dams, people began to realise that the severity of the drought was not only directly related to the scantiness of rainfall, but also closely and intimately related to the land use and, water consumption pattern, the general robustness and health of the environment, the green cover available and the nature of livelihood activities. Thus, they began to see inter-relationships between the various systems that interact and influence each other in a particular geographical area. Thus the interactions between the livelihood livestock resource use dynamics and natural sub-system greatly influenced and impacted upon the severity or incidence of a meteorological drought.

The second learning that people drew was that it was necessary to conserve every drop of rain water. And rather than focusing only on impounding it along the drainage line, conserving and trapping it in situ, as and where it falls, was not only cost effective, but also technologically feasible, economically viable and offered far greater returns in terms of both the volume of water conserved as well as in the distribution of benefits as well as in the decentralized nature of its distribution, thus, to impacted favourable on the issue of equity.

Together with these realisations, people also began to understand that such an effort would have to be undertaken on a watershed basis because a watershed provides a natural unit for planning. It is also the area within which the terrestrial hydrological cycle is worked out. Further it is also a natural ecological niche, which, in itself forms a unit and a whole. With this realisation also grew the appreciation that it would not be possible to undertake regeneration of the

environment along watershed lines unless all parties, stakeholders shared the same vision and understanding, came together and decided to do something about it. Thus watershed development came to be seen as a task that required the collaboration of all sections of society and all groups owner and user groups - dwelling within a watershed. It also called for a multi-disciplinary and multi-sectoral approach that required the following of an integrated, systematic and ridge-to-valley approach.

However, all these developments took some time in coming and did not develop systematically or in a linear fashion. They evolved, NGOs as well as people and the government began to undertake a series of measures to impound rainwater, albeit in a sectoral and unintegrated manner. Emphasis, however was given largely to water harvesting structures along drainage lines. Nevertheless, the impact of these measures (check dams, gully plugs, nalla bunds, gabion structures and percolation tanks) began to be seen and people began to understand the necessity of preventing run off. These fairly large-scale, though partial efforts began to bear fruit with every subsequent drought.

In 1987 another drought hit Maharashtra which meteorologically was even more severe than the one in 1972. Nevertheless, this time, the incidence was not half as much as that felt earlier and it was quickly realised that that was because of a fair degree of drought-proofing that had been worked into the rural economy as well as the villages resulting from the various water conservation measures that had been undertaken earlier. During this time, a couple of NGOs had also undertaken comprehensive treatment of water and soil conservation along watershed lines in a couple of villages and these villages, despite the drought, lived and behaved as if they had experienced a year of normal rainfall.

At this time (1987), a group of NGOs as well as government officers met to discuss the response that could adequately meet the challenges faced. Present at that meeting was Fr. Hermann Bacher, a Swiss Jesuit, who has lived in

Maharashtra since for over fifty years and been involved in the development field for over forty of these. It was unanimously decided that large-scale micro-watershed based activities should be launched by NGOs in cooperation with the Government across the drought affected areas of the State. However, the constraint faced by the NGOs was availability of sufficient finance, access to technology, skills and support, both political and administrative, from the government. Without these three critical inputs such an effort could not take off. Fr. Bacher took up the challenge of organizing these resources and the NGOs took up the challenge of implementing such a programme with Govt. support, should the resources become available. This concreted effort which involved various individuals, rural communities, institutions, NGOs, the governmental financial and political establishments, both in India and in Germany, got finally grounded in 1992 and came to be known as the Indo-German Watershed Development Programme (IGWDP), Maharashtra.

Since the last nine years, this Program is operational in over 200 villages of the State, nestled in watersheds covering a gross geographical area of 131 thousand hectares, inhabited by over 2,00,000 people and located in 5 agro-ecological zones. From small beginnings, it has now spread into various parts of the State and has created in many areas, a movement amongst rural dwellers for watershed development. It has been successful not only in directly addressing and mitigating the impact of drought but has also influenced considerably the national debate within India on how rainfed farming systems can be stabilized, rural income flows based on agriculture and allied activities enhanced and how people can be involved in regenerating and managing the resources within their own environment or living space. This has led to several policy changes as well as the evolving of a paradigm for rural development in rainfed areas of India.

A distinguishing feature of this Programme is the central role given to the watershed dwellers as well as the emphasis on building networks and

partnerships between the local communities, the developmental network surrounding them or in their vicinity, and the various institutions, in the public, private and civil sectors. The villagers receive the funds directly and they plan, organise implementation, undertake activities and are responsible for its maintenance. They are supported in this effort by NGOs in whom they have confidence and who have developed a rapport and a relationship of trust with the local community.

Supporting these village communities as well as NGOs in the area of capacity building, hand-holding, extension support as well as linking these with the developmental and governmental framework, at the regional and state level, is a voluntary agency called the Watershed Organisation Trust (WOTR). WOTR performs the functions of identifying voluntary agencies, prospective watershed communities and areas and, through a systematic and detailed pedagogy, builds up gradually the capacities of both these partners to undertake watershed management in an effective, efficient and sustainable manner. The government provides political support as well as complimentary developmental finance by way of infrastructure, such as roads, erecting a water supply system, telecommunication links and other schemes that address health and hygiene needs, etc. In some projects the Government has actually funded individual watershed measures like checkdams, afforestation etc. While the local people contribute towards a part of the cost, the direct unmet costs of the watershed project are funded by German Development Cooperation routed through the German Agency for Technical Cooperation (GTZ) (routed through WOTR) and the German Bank for Development (KfW) (routed through NABARD).

Today, this large-scale effort has resulted not only in providing direct beneficial impacts at the project level, but has also created a wide spread awareness of the benefits of watershed development as well as, in a way, lit the flame of demands from villagers upon government institutions and other resource providers to

support them in undertaking such efforts within their own living spaces. An important outcomes of this people managed self-help effort, has been the developing of managerial and institutional capacities at the local village level. The process of coming together, of negotiating arrangements, arbitrating conflicts and working out compensatory as well as alternative mechanisms enables a community to work through its historical divisions that tear it apart and to discover within itself the strength to face calamities, overcome limitations and look to the future with confidence. This process of empowerment, wherein women are actively mainstreamed at the outset is very important from the point of view of sustainability of the effort as well as acquiring the competencies, access and know-how to take advantage of opportunities offered not only locally but even regionally by the market economy as well as the developmental and institutional network in that region.

Another distinguishing feature of this Program is the intensive effort and emphasis it lays on mainstreaming gender and facilitating the entry of women as active decision makers in the institutional life of the village particularly with respect to the implementation and organisation of the watershed project at the village level. For some years initially natural resource management and water conservation was viewed as a task wherein men decided and women did the work. It gradually dawned upon the NGOs and Program actors that women were constituency with the largest claim on the employment since they were primary drawers or stake holders. They fetched water, collected fuel wood, grazed the animals, worked the fields, gathered the produce, processed both farm as well as forest produce and were, in fact, were the major providers of the family and household needs. Therefore, unless they were actively involved in deciding what to do, particularly in the area of biomass development, afforestation, livestock development and agriculture activities, it would not have been able to ensure that what was done would firstly meet household needs, or would continue once the project was over. Hence, a conscious effort was made

by WOTR, which together with its partners, developed a methodology to actively mainstream women and gender into the social and political life of the village through the medium and possibilities offered by the project intervention.

It took as a starting point a non-controversial and consensual approach, where measures were undertaken to involve the men-folk also in the empowerment of their own women. This approach of integration, which while at the same time undertaking measures that provided space and a certain reserve for women, has yielded rich benefits. It has not only made women assertive and self confident, but also ensured their acceptance by the men-folk and power brokers in the village. While there is still much to be done and many more milestones to cross, more than a few steps in this direction have already occurred. In several places, the vibrancy as well the nature of transactions that are occurring in women's self-help groups, which are focussed initially on thrift and credit but then diversify into other developmental and income generating activities, stands testimony to the fact that, given a chance and an enabling environment, women can not only better their lot, but improve their standing in the male dominated political and social life of the village. This considerably enhances the maintenance and continuity of works that have been undertaken commonly.

## Impact of watershed development:

Watershed development – a creative shift from resource exploitation to resource mobilization – if implemented with the active participation of watershed dwellers on a scientific basis, as explained in the previous sections, has immense potential to improve the socio-economic lives of the poor in rainfed agro-systems. Different research studies and evaluations conducted in the Indo-German Watershed projects clearly substantiate that the overall livelihood opportunities have improved considerably through the enhanced natural, economic and social resources.

In Sherikoldara watershed (Taluka Parner, District Ahmednagar) the area under kharif and rabi crop (monsoon and winter crop) has increased by 19.12% and 21.16% respectively. Besides, 65 Ha. of area has been brought under summer crop (third crop) which was non-existent before project implementation. The number of crossbred cows has increased from 16 to 174 and daily milk production from 100 litres to 1350 litres, which can also be attributed to the increased availability of fodder (1400 cartloads) and water (number of perennial wells has increased from 8 to 320 in a pre-post comparative scenario. Due to better income availability, where there were no permanent cement houses, 55% of households today are permanent houses. There are 9 women's and 2 men's savings and credit groups in Sherikoldara.

Rajani watershed (Taluka Pandharkaoda, Dist. Yavatmal), a tribal habitat also shows comparative improvements in agriculture production and other socio-economic indicators. Earlier, 40 families were migrating regularly for work, now it has come down (distressed migration) to 5. Where there was no drinking water available from the month of February, it is now available throughout the year. 59 ha of additional area has been brought under cultivation and 10 ha. under perennial irrigation with vegetable crops in summer months. Wheat and soyabean crops are newly introduced with a yield of 10 quintals/ha and 9 quintals/ha respectively. Cotton production has increased from 5 quintals/ha to 8 quintals/ha and paddy production from 8 quintals/ha to 13 quintals/ha. The total production of cotton has increased by 1146 quintals and of food grains by 1157 quintals. The project generated 75,200 persondays of labour within the village and there two instances where the landless have purchased land for cultivation from their savings. There are 4 women's SHGs which have undertaken kitchen gardens, attended health and are running a flourmill. Where there were only 5 permanent houses, now there are 120 concrete and tile houses. People have constructed a Community Hall and a Village Assembly Hall (Gram Sabha mandir) through their contribution.

In Talawali watershed (Taluka Palghar, District Thane) an Action Research study has shown that there has been a decrease in the lower income category, with a resulting increase in higher income category. One of the biggest changes in this village has been the introduction of pigeon pea and vegetables cultivated on field bunds which brought additional income, besides the income from fodder (due to grazing ban) which has a ready market due to its proximity to a major city, Mumbai (Bombay).

In Chincholi (Taluka Parner, District Ahmednagar) the same study has shown a 31% increase in the area under irrigation even though the village received only 290 mm of rainfall in the study year. Per hectare production also has increased in this village. Production of pigeon pea has increased from 3.75 quintals/ha to 10 quintals/ha and that of pearl millet from 3.5 quintals/ha to 6.25 quintals/ha.

Mrs. Shevantabai Thakre, a tribal woman farmer from Mandwa watershed (District Nagpur) had this to say in her lifestory recollection, "In our field we now grow jowar (sorghum), gram, pulses and cotton and we have introduced new crops such as soyabean and wheat. We also have improved our well. We took a loan from the bank to dig the well. Now I have the necessary farm implements and this year (1997) I purchased a pair of oxen for Rs. 8000/- from the earnings I got from watershed work.

Fodder availability has considerably increased in all projects ranging from 50% to 400%. At the same time the plantation done and its survival rate is also very noticeable. In Darewadi more than 300,000 saplings were planted, with a survival rate of 95%. Fodder and water availability has also helped in dairy as an additional activity. In Darewadi where there were only 14 improved cows and less than 100 litres of milk, now there are 85 improved cows and 1100 litres of daily milk production.

Mr. Madhav Lahange, Chairman of VWC (Village Watershed Committee) Talawali watershed and a tribal farmer has this to say, "Because of plantation done on waste land our income has gone up. Lots of farmers have planted teak, subabul, mango, etc. Earlier cattle used to graze in these places and there was no grass. Since free grazing is stopped by farmers, the growth and regeneration of grass has improved a lot. The villagers have decided collectively that cattle should not be grazed on the wasteland and now we get good price for grass collected from there, after our use."

Social cohesion and local self reliant institutions are another important impact of the programme. The ban on alcohol consumption in Darewadi and Talawali is one such incident realised through the unity of villagers and strength of the newly formed women's group. There are now totally about 1059 Savings and credit groups of 15,089 women with a total savings of Rs. 62,29,181 (DM 283,144.6) @ 1DM = Rs. 22/-) . 266 projects for enhancing the quality of life were taken up (like biogas, latrines, soakpits, improved cooking devices, day care centres, kitchen gardens, etc.) benefiting 11352 families. Besides, there are 105 income generating projects like nursery raising, dairy, poultry, cow rearing, stall-fed goat rearing, utensils on hire, grocery shop, flour mill, gas agency, vermi-compost, threshing machine etc. involving 3299 women.

The opportunity to go to other places interact with others and learn as a group through trainings, exposures, shibirs (seminar), melavas (fairs / gatherings) etc. also has built a sense of confidence and worth among the poorest of the poor as their narration shows in many of the life stories collected.