

EDUCATION AND TRAINING FOR DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES

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ABSTRACT

Water must be considered in homological term encompassing water in clouds, atmosphere, humans, animals, that on the ground and one that is underground. Here the conjunctive use of water may come in picture. The fact that rainwater is the sole-supplier to all kinds of water on the planet must be understood. The replenishment is done only through it. There is no other supplier available from within the earth or from the space. Looking at the rainwater patterns in India, it appears that it is still a manageable resource. This is confirmed by following facts:

- ✓ *Rainfall in the State of Maharashtra is time bound. Thus communities can prepare themselves up-front to catch it*
- ✓ *There are very few places receiving less than 400mm of rainfall in the State of Maharashtra. Thus at-least 4m of water slab is available anyway, anywhere*
- ✓ *The State of Maharashtra covers about 92% of Hard Rock, in the form of Deccan Basalts and Granites. Remaining is Sedimentary Rock or Alluvium, where depletion of water levels is alarming. Thus there appears “No-Choice” but is mandatory*
- ✓ *Rainwater acts as diluter to the most dangerous problem of pollution*
- ✓ *Cost on transportation of water is avoided as it is Omni-Present*

Educating the communities on water budgeting on village – level basis is the first priority. For this, training needs to be imparted on rainwater measurements and local fluctuation of water table. Also the analytical part of this exercise must be elaborately spelt out. This will also bring in the “What if this” scenario options. These may be brought to them in “The way – They understand” in pictorial, graphical or even in a demonstrative speech. The decision of the Gram-Sabha shall be final and binding on all stakeholders. The water budgeting done in pre & post monsoon conditions would help the communities understand the scope of it in better ways. The technical in-puts required from time to time must be given to villages by the Government. Water quality consciousness must be generated amongst the communities. Communities must take ownership of assets in the long run to bring in sustainability. Here the Government must play a facilitator’s role. Here the community shall be in the front with the backing of the Government.

FULL-LENGTH PAPER

Maharashtra occupies predominantly hard rock terrain (about 95% of its geographical area of 307690 sq km). The inherent heterogeneity and comparatively low water yielding capabilities are prevalent in hard rock aquifers (81% Deccan trap basaltic terrain and 10% granitic and gneissic metamorphic terrain). The semi hard rock aquifers (40% sedimentary terrain) and alluvial aquifers (4-9% alluvial plains) contain greater productive capacity.

The increasing water demand & indiscriminate pumping is causing the problem of groundwater sustainability. A diverse hydro-geological setting with variation in geological formations, geo-morphological features and hydro-meteorological conditions have given rise to widely varying ground water conditions in different parts of the state. The “weakness” of hard rock being ‘hard’ can be converted in to its “strength”, as the soil / water conservation in ‘soft’ rock or ‘Alluvium’ is difficult to take place.

Since inception, the Government of Maharashtra (GoM) has focused on addressing the drinking water and sanitation needs of the rural masses. Though these efforts of the GoM have been successful to a certain extent, there have been major shortcomings with regards to quantitative and qualitative sustainability of the service

level because of lack of primary stakeholders (community) participation, their sense of ownership of the project and in the operation and maintenance (O&M) of the water supply and sanitation systems.

“Whose problem is this anyway?” Certainly it is neither the problem of politicians nor the bureaucrats, but of the community. The problem may be amicably solved where it belonged. Otherwise sometimes the solution becomes more dangerous than the problem. And moreover solution should not be seen as fire-fighting measure but should bear a sense of preventive attitude. It must be firmly believed that the local residents living at a place have more knowledge of that place rather than anybody else. And if the best solution has to come, can be expected from them.

Water levels have depleted resulting into diminishing reserves and this has happened because of negligence of many people or more greed of few. The facts must be bluntly and scientifically told to the community. Simultaneously the options to reverse the trend need be discussed at full length. Capacity building programs must be undertaken with strong and continuous IEC campaign. For this Crop-Water budgeting sessions must be undertaken. Strong database on aquifer level must be built up. The solution cannot be village level or watershed level planning, but aquifer level thinking through participatory initiatives.

There are few examples in the State of Maharashtra who have demonstrated that ‘Water Users Associations’ can manage even within what is available. These innovations must upscale, showcase their success and train the underprivileged villages. The solution to this problem is not in supply side initiatives but in demand side management. Community monitoring, social auditing will play major role. Sustainability can be achieved only if there is self regulation than law enforcing.

If ground water is considered as social commodity then it must be judiciously distributed amongst the community. If the person becomes customer and then the idea of users’ satisfaction will come in to force. If Government acts as facilitator with technical and social inputs imparted through expert teams, community will certainly be in position to manage the water in the aquifer and we may not hear from them “Who moved my cheese”.

Water on Earth is abundant, yet a scarce resource. Here, scarce resource relates not only to the quantum available for human consumption, but also with the quality of it for human consumption. Adequate database must be created on the dating of the groundwater. The idea that water does not become stale must be propagated efficiently and repeatedly. Communities must be made to understand that it is not the source that feeds them is important, but it is the resource that feeds their source is equally and significantly important.

Thus just as quantity of water present in their source is important, equally important is “How much and in what Time” it is recouped after de-watering. Thus it is the Source – resource relationship that is playing the leading role in sustainability. Also communities need to prioritize the uses, like water for human and Cattle consumption, water for domestic use, for industries, and most importantly the water for agriculture sector which predominantly mines it.

Difficulties arise where there are large numbers of individual stakeholders whose interests need to be represented. In this case it is necessary to provide for the formation of federations representative of each stakeholder category, and to vest these federations with the authority to appoint their representatives. The decision of the selection of committee members is left to the Gram Sabha where more than 40% of the voters from the Gram Panchayat, come together and decide after through discussions in one or more sittings. These meetings take place at times convenient to the community. Women Gram Sabha precedes the main Gram Sabha and decisions taken are mandatory to be confirmed or rejected with due reasons in the main Gram Sabha. Due care is taken to maintain the transparency in all processes at all times.

The quantity of aquifer water can be easily related to the water levels in the aquifer. A measurement of water levels by the community is comparatively easier task. The experts will then prepare a rational model and help community to do water budgeting and crop-water budgeting on their own.

As there is heterogeneity in the aquifer domain in hard rock areas, in terms of its length, breadth, gradient, and thickness, due care must be taken to come to a conclusion in regards to its actual extent and geometry. Primary

and secondary porosity of these aquifers in terms of vesicularity or fracture porosity needs to confirm upfront. Once this is clearly defined by the expert, its management through the community with the help of Technical Service Providers and facilitation of Voluntary organizations would be comparatively an easy task. The artificial recharge to these aquifers can be made maximum to its potential. Further recharge would go waste as rejected recharge.

Voluntary Organization were engaged to enable communities in the project villages to make informed decisions and prepare a sustainable integrated water management plan including drinking water supply and environmental sanitation and to empower them to undertake implementation, O&M activities. This has been accomplished through mobilizing communities in villages falling within the pilot aquifers, to generate demand for holistically managing their all kinds of water requirements through community action in an integrated manner- including water supply and sanitation; sensitization, creation, operation and institutionalization of new holistic water management and allied natural resource management concept, policy and strategy, and capacity building programs for the communities to enable them articulate their needs, prepare plans, implement them, manage the resources and monitor the results.

It is now very much clear that success of any project in water sector depends mostly on:

- Community learning
- Community realizing
- Community grouping
- Community participating
- Community contributing
- Community involvement
- Community monitoring
- Community reallocating
- Community repairing
- Community managing
- Community leading from the front

If these points are to be achieved then the entry of Voluntary Organization is warranted right from the beginning. All the above benchmarks can be handled in right spirit by the participating team of Voluntary Organization. Technical literature in local language need to be developed and distributed in the project area villages. This will have coloured diagrams, drawings for the easy understanding of the community. This will enable community to understand the real need of the interventions and will increase their active role.

Though there are examples that contain rich information and examples on groundwater management policy, elsewhere, the problem needs to be sorted out looking into local and regional conditions. People's participation is the main indicator for the success of policy reforms, decentralization and decision making at grass root level. Designing of groundwater policy should take into consideration source-resource relationship and needs. Conjunctive use of water is a less understood part in water management and it may vary with time and space. It has many dimensions. Thus the reform process must be dynamic and continues and it must be clearly understood by the users.

It is evident that "Force – Down" regulations have under-performed. The "Self - Governance" regulations are prevailing to be successful. This is possible if the management of water is participatory. The Planning Commission of India in its Approach Paper for the 13th Five Year Plan (2012-2017) has clearly stated that the aquifer mapping is essential if the water management by the communities is to happen on participatory basis for a sustainable development of water sources.

There are some demonstrative examples available on these lines in the State of Maharashtra and the State of Andhra Pradesh. The communities must be educated to an extent that they must start respecting **RAINS**.

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BRIEF PROFILE OF THE AUTHORS

"Dr. Satish Devidasrao Umrikar graduated in Geology from the Shivaji University in 1982. He obtained M.Sc. in Geology in St. Xavier's College, at the University of Mumbai in 1984. Later on he obtained a Ph.D. in the same College in Geology at the University of Mumbai in 1996.

He initially worked with a NGO, named, Action For Agricultural Renewal in Maharashtra. Later on he worked with few private drilling firms as Manager-cum-Geologist. Subsequently he joined Government of Maharashtra service in the Groundwater Surveys & Development Agency since 1986 till date. From 2002 he is working on deputation in Water Supply & Sanitation Department, Mantralaya, Mumbai on various important posts that involved policy framing exercises. One of such endeavours was working with the World Bank aided Project. He has participated in many national and international seminars/workshops and bears many publications to his credit".