P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-6* ISSUE-8* (Part-2) April- 2019
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Water Conservation and Younger Generation: A Critique

Abstract

Awareness and literacy of the growing scarcity of fresh water has led to significant changes in domestic legal and regulatory frameworks for water management and water governance in most countries. As water has become scarcer, governance in World Community have intervened and used legal tools to protect the resources and to manage it judiciously to achieve and economically efficient and environmentally sustainable management of water that contributes to offsetting the effects of its increasing scarcity of freshwater. Present water law regime is the result of discussions that have taken place on the international and domestic fronts. On the one hand, as the shortage and deterioration in quality of existing stocks of water have become a source of concern for all nations, a series of international events were convened with the purpose of agreeing water management principles that would serve as guidelines for local action. On the other hands, at the national level, countries simultaneously acknowledged water management as a matter of national importance that deserved exhaustive regulation in domestic legislation.

The Constitution of India recognizes a right to life but does not specifically recognize a right to water. However, the Indian Higher Judiciary, in the early 1990s, read the right to water within the right to life under Article 21 of the Constitution through the verdict in *Subhash Kumar V State of Bihar,* AIR 1991 SC 420, and this was much before the right to water became a subject at international level. The case law of early 1990s has been reiterated and further development over time, giving it more content. The Higher Judiciary (Apex Court and High Courts of States) have also derived the human right to water from Article 47 ('Duty of the State to raise the level of nutrition and the standard of living and to improve public health') of the Constitution. This was for instance, the case in *Hamid Khan v State of Madhya Pradesh*, AIR 1997 MP 191, the High Court of Madhya Pradesh interpreted that under Article 47, the state has a duty 'towards every citizen of India to provide pure drinking water'.

Brijesh Lata
Research Scholar,
Dept. of Law,
Mewar University,
Chittorgarh, Rajasthan, India

Shailendra Kumar Sharma
Co-Guide
Dept. of Law,
D.A.V. College
Muzzafarnagar, U.P., India

Keywords: Water Conservation, Younger Generation, Water Literacy, Governance, Rainfall.

Introduction

Water conservation is a very serious concern in our country as many states of country are facing accute water scarcity. Tamilnadu, Karnataka, Relationship, Andhra Pradesh, Maharastra, Himachal Pradesh and Uttarakhand are most water stressed states.In other parts of country are also facing water scarcity and many parts of water rich states are marked as dark zones by Central Ground Water Board.In India mismanagement of water resources and imbalance of ground water and surface water are main causes of water problems. Water is also highly polluted and contaminated.It is the duty of younger generation to understand the problem of water mismanagement and scarcity and to work for better management. Water management and water relateted issues must be included in education system.

Younger Generation will work in better way to proper management of water for the sake of future generations.

Aims of the Study

The main aims of the study are :

1. To study the causes of water pollution.
2. To find out the procedural flexibility of legislation regarding water pollution.
3. To study the willingness of to alter the rules of procedure regarding environmental jurisprudence.

4. To analyze the creative arid activist interpretation of legal and fundamental rights.
5. To find out the remedial flexibility and ongoing judicial participation and supervision.
6. To study the status of water conservation knowledge in younger generation of India.

Objectives of the Study

In present circumstances the scope of this study regarding the adulteration of water upto the level of pollution is very much wide and important. Whether it is the matter of human health or protection of the rights to life of human beings. We must be aware of this problem; especially in uncontrolled industrializations and unorganized system of damaging the waste liquid materials this problem is increasing day by day.

Not only op to the limits of protection of life of human beings but also for the regulation of social setup and social phenomenon it is very necessary to forward a valuable study about the water pollution.

Ways to Conserve Rain Water

The first and foremost character of this rainfall, we must realise, is that it is seasonal, confined to just about 60 rainy days in a year. Human ingenuity has to device ways and means of storing this water and making it serve our needs not only for the rest of the year but also make provision for one or two years of deficient rainfall. The most obvious concentration of effort should, therefore, be directed towards retaining the rainfall where it fell.

Deforestation of land, absence of contour bunding, increased urbanisation, creatiing pockets of enormous water consumption, total disregard to groundwater recharge have all had the net effect of making the bountiful supply of water vanish in no time. The construction of large dams and impounding large volumes of water have not served the country well. They have caused environmental damage and their utility is greatly reduced because of rapid siltation.

Need To Identify Regions of Rapid Run-Off

Generalised maps are available showing the pattern of distribution of rainfall. These are not of much value in carrying out detailed hydrogeological studies of specific areas. More important information would be the run-off component for the different topographic and climatic regions and for the different basins and sub-basins. This information has to be represented on maps showing specifically areas of concentrated run-off.

Significance of Rain Nakshatras

It is also not enough to have just the annual and monthly rates of rainfall. Such data to be of value has to be provided for shorter periodsweekly or pentad (five-day) periods. Our ancients had recognized the importance of classifying rains into 13 or 14 day periods (RainNaskshatras). Observation extended over hundreds of years had established different degrees of reliability and characteristics for each of these rain periods. What is needed today is a scientific analysis of this ancient practice of reckoning reliability of rainy periods. Knowledge has to be fed to the farmers in a language which he understands.

Utility of Tanks

Our ancients again had greater appreciation of the pattern of distribution of rainfall and had created numerous tanks and ponds throughout the land to catch and conserve rain water where it fell. Through criminal neglect we have allowed most of the tanks to get silted up. Their storage capacity has been greatly reduced. The thick accumulation of impervious clay has effectively prevented stored water from percolation and contributing to groundwater storage. The net result has been the drying up of tanks and the progressively dwindling supplies of groundwater.

Individual effort at local level has almost disappeared giving place to too much dependence on governments to cater to the primary needs. Self-reliance as a worthy way of life has given place to one of increased dependence on doles form government.

Make Water Stay on Land

What is urgently needed is a reversal of this trend and the implementation of land-use practices aimed at making the water to stay on the ground and not allow it to run-off. We have to concentrate on run-off farming meaning thereby practice aimed at conveying precipitated water from the same catchment to growing areas without interim storage. Individual effort at local level is called for. Erection of contour bunds and stone lines to check the flow of water, growing of rows of trees to serve not only as wind breaks, but as agents to catch rain water, such practices, aimed at allowing water to percolate and recharge the groundwater body, are of greater value than construction of large dams at enormous cost. Greed has been the object of the giant projects rather than satisfying our immediate needs. Practices as those enlightened above will encourage participation of the local people, a procedure which has been consistently ignored by our planners. The participation of local people in all industrial and developmental activities is essential both on moral and practical grounds.

Water Conservation Methods

The latest, well-planned project is across the Narmada-SardarSarovarProfect. An analysis shows, that on an average the Dam would be full by 15^{th} August of each years, and that thereafter, fifty percent of the inflow, an amount sufficient to fill the reservoir three and a half times over, has to be let off *via* the spill-way. If we take the rainfall over the whole catchment, the amount of water used by the Sarovar will be only 20%. The case with other rainfeddams, is worse; on the average, the rainwater utilized by them ranges from 8% to 12%.

It is strongly submit that, water has to be collected and stored almost where it falls. It is felt that a large number of water ponds (or tanks), each about a hectare in area, and of depth 8-10 metres, and a catchment area of 30 to 40 acres is the best solution. Allowing for about 2 metres of evaporation, 6-8 hectare meters of water will be available from each tank for use in the non-rainy months. Such water ponds would act as percolation tanks also. Water would seep along the sides and increase the ground water level. Dug-wells in the neighborhood would have water. Trees would grow in the neighborhood. If

P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-6* ISSUE-8* (Part-2) April- 2019
E: ISSN NO.: 2349-980X Shrinkhla Ek Shodhparak Vaicharik Patrika

they are fruit trees, birds would roost, and would act as efficient scavengers, and pest controllers. The tanks and the trees and the birds would form a nearly balanced eco system. Instead of dug-tanks, one can have counter-bunded tanks, depending upon the topography of the land. In a warm country like India, a large amount of biomass would grow in the tanks, fist algae, waterplants like lotus. They would die and get deposited at the bottom. Every two or three years the tanks should be cleaned of the slush and would be used as rich organic fertilizer. But all these activities constitute local skill and effort and self-confidence of the rural people.

There are water harvesting methods at the micro-level. Water falling on the roofs of houses and individual farms are to be collected. Each plot of land should be bunded around, so that no rain water escapes as run-off.

Water should be made to percolate gradually into the ground. An innovative farmer, dug channels in his own small farm to collect the water that falls from the skies. Each channel was 10 cm deep 15 cm broad, and 10 or 12 metres long. Another farmer, bunded his farm, found the direction in which underground water flows and put up an underground check dam.

The river Cauvery flows over parts of Tamil Nadu, where no rain falls in July and August and the river is in spate due to heavy rains over the western Ghats.

The ancient Tamilians, had constructed a net-work of underground channels of granite slabs, to convey the flood water into a network of large water ponds- called *Teppakulams*. Each tank, had a central platform on which some deity was installed so that people may respect the tank and the water.

There are parts in Australia where the average annual rainfall is 18 cm. They collect every drop of water that falls, on the roofs, lands, even roads. The water is directed by cemented channels into storage tanks. In that area a Wool Industry-sheep rearing and shearing- is thriving. We are not that poorly off in our rainfall amount.

Indigenous Art of Artificial Recharge to Depleted Aquifers In India

There has been a steady enhancement in the irrigation potential from ground water which has gone up from 6.5 M.ha. in 1951 to 35.58 M.ha. in 1992.

Food grains production in the country was 50.8 million tons has risen to 191 million tons in 1994-95. Groundwater contribution is significant as more than 50 percent of the irrigated area is through groundwater and in many districts it is more than 80 percent.

The present rate of annual gross withdrawl is of the order of 16.45 M.ha.m. Since the distribution of groundwater resource of the country is not uniform due to variation in rainfall and hydrogeological conditions, for the present rate of development, the draft exceeds the annual available recharge for irrigation.

Effects of Overexploitation

Fluoride content in groundwater have increased in Gujarat and arsenic content in West Bengal, Bundelkhand and some areas of Eastern Uttar Pradesh due to lowering of water table exposing aquifers to oxidation.

Augmentation of Groundwater Resources

The non-availability of sites for surface storage has led to considerable quantities of water being lost through surface runoff. Vast storage space is available in ground water reservoirs. It is therefore possible to harness the large percentage of excess runoff going as waste to sea and store it in the available groundwater reservoirs by creating recharge structures.

Rainwater harvesting to augment water resources is not new in India. Percolation ponds (village ponds) and roof-top rain water harvesting have been practiced from a very long time.

Artificial recharge is the process by which infiltration of surface water into the groundwater system is promoted by artificial means.

Methods of Artificial Recharge

Spreading Method

This is most widely adopted and includes basin method, stream channel method, ditch and furrow method, flooding method, irrigation method, pits and shaft method.

Water is either ponded or allowed to flow over natural or artificially prepared channels or ground surface to maximise the area of contact and increase detention time of storage and the area of contact, in order to promote process of recharge to the ground water body. These methods are suited to recharge phreatic aquifers and semi-confined aquifers which are in hydraulic connection with phreatic aquifers. Recharge to be more effective, the materials in the zone of aeration should have good vertical permeability to aid percolation and the underlying aquifers should have good transmissivity to transport the recharge water away from the spreading area. Water table should be sufficiently deep so that sufficient storage is available to accommodate the recharge water.

Percolation Tanks

Percolation tanks are shallow tanks constructed at appropriate places in natural or diverted stream courses and provided with a waste weir to allow excess water to continue its course. Percolation tanks are located where surrounding area is flat or gently sloping. *A* pre-requisite is that the bottom of the tank and soils around are permeable to allow quick percolation with minimum of evaporation losses. If the structure is located at places where water table shows a downward slope, recharged water moves away from the recharge site, thus constantly providing space for additional recharge.

Steam Channel Method

Water-spreading in stream channel involves operation to increase the time and area of water contact. This requires upstream storage facilities to regulate stream flows and channel modification to enhance infiltration. The stream should be influent and stream bed permeable. Ideal one is where upstream reservoir limits the flow rate and does note exceed the absorptive capacity downstream. The improvements required in stream channel are: widening, levelling, scarifying or ditching of the channel, constructing low check dams, without causing flood hazard; temporary low check dams consisting of stream bed materials and comprising L-shaped finger levees at the end of the high stream flow season. An effective way of lengthening the flow channel is to erect series of dykes at either banks, extending for about three-fourth the distance across the stream channel so as to direct the flow to take a sinuous course.

Sub Surface Dykes

Sub surface structures are feasible in hard rock areas in narrow gently sloping valleys where bedrock occurs at shallow depth and valley fills consist of 4 to 8 m of pervious materials. Catchment should have good rainfall to recharge the aquifers upstream of the sub-surface dam. The dam consists of an impervious wall with a jack well and collector well which are interconnected. The wells can be on the upstream of the dykes oron the dyke section itself depending upon the area of influence. The dam can be constructed with materials like clay, tarfelt, polythene sheets, bitumen besides bricks and concrete depending on local conditions. The wall of the dyke to be built could be thin without any buttresses. By keeping the top of the dam 1 m below the land surface the riparian rights of the farmers downstream are not infringed.

In areas covered by sedimentary rocks where wide streams with high flow levels exist, sub-surface dykes are more effective. Such dykes are often built in river beds where base flows are common for sometime during the dry season. River beds generally constitute highly permeable aquifers with good storage potential. The most common purpose for damming groundwater is to store water below ground level and provide water for wells located upstream. Where water table is quite deep and where heavy groundwater development has resulted in declining water levels, sub-surface dam play a significant role by harvesting both surface runoff and subsurface runoff.

Recharge Well

Recharge rate depends on the specific capacity and the available drawdown in a well. The available pressure-head of a recharge well is functionally the converse of the available draw down in a well. It is said pumping wells tend to be self-cleaning, while recharge wells tend to be self-sealing. Clogging occurs by silt accumululation, air lock, bacteria and chemical reactions. If the recharge wells are pumped periodically, it is possible to maintain their recharge rate. Recharge rate ranges from 0.2 to 2 million litres/day; 6.5 to 40 million litres per day have also been achieved.

Recharge tube wells apart from recharging aquifers, build up and maintain ground ridge to control sea water intrusion.

In cases where deeper aquifers are to be recharged by storm water which is muddy, a filter bed is provided on the top of the recharge well which prevents the silt from entering the well.

In hard rock areas since the diameter of bore is only about 150 mm it will not be possible to provide a filter through the entire depth. In such cases a slotted pipe is lowered to the top of the hard rock and the annular space between the casing and the weathered rock is provided with a coir rope pack to prevent sand and silt entering the bore

Municipal and industrial waste water can be reclaimed through various methods of artificial recharge depending on local conditions. The process of purifying and reclaiming waste water by allowing it to pass through soil and aquifer is referred to as Soil Aquifer Treatment System (SAT). In SAT systems waste water or other low quality water is purified by physical, chemical and biological processes as it moves through soil and aquifer. The purified water is collected from the aquifer with drains or wells in such a way that the movement of the renovated water is confined to certain section of the aquifer. SAT systems should be designed to provide sufficient underground detention time and travel distance for the waste water, so that the renovated water will be of required quality. Care should be taken to avoid undue rise of water table below infiltration systems and pollution of groundwater outside the SAT system. This system is more effective in alluvial areas as granular nature of materials have good filtration characteristics. Consolidated rocks, where groundwater occurs in fractures, are not suitable for SAT system. For a SAT system to be more effective, aquifer should have good infiltration properties. To achieve maximum possible quality improvement it is advisable to keep underground detention time of at least one month and 100 metres underground water travel distance. The coarser the material, the longer the detention time and travel distance is required.

Aquifer Storage and Recovery (ASR)

ASR is a water supply concept in which potable water is stored underground by injection into a suitable storage zone during those months of the year when available supply exceeds demand. The stored water is recovered from the same wells to meet the peak demand exceeding supply. This water does not require further treatment other than chlorination.

The concept of ASR is relevant in areas where surface reservoir resources are becoming less feasible. The surface requirement of the technology is minimal with stored water not susceptible to evaporate and less susceptible to contamination.

Conclusion

Food and drinking water security is fundamental for healthy growth of the Society. Water is vital for drinking, sanitation, and plant growth. Crops need irrigation at critical periods of its growth to make up for the soil moisture deficiency. Failure of monsoon or drought is a bane causing drinking water crisis, lack of sanitation, decline in agricultural production and instability of rural economy which is overwhelmingly based on agriculture. All round rural development depends on sustainability of water and calls for water conservation, which means optimal utilisation without wastage. Optimization of water use needs multilateral integrated approach of soil, water and crop management. This is possible only through conjunctive use, various indigenous soil moisture conservation measures, water economy and rainwater harvesting or artificial recharge. Conjunctive use of surface water and groundwater should be integral parts of all surface water irrigation projects for optimal utilization of total water resources, for mitigating water logging, and for enabling muti-cropping and enhancing agricultural production. In addition, sprinkler and drip irrigation ensures water economy along with increase in irrigated areas and- agricultural production. Innovative and indigenously developed soil moisture conservation techniques of Water Literacy are necessary steps towards a great task of water conservation.

Rainwater harvesting augments available water resource, and effects artificial recharge through salvaging runoff water. It is cost effective, ecofriendly, and needs simple locally available materials and technology like terracing, contour bunding, nalabunding, check dams, percolation tanks, subsurface dams etc. Traditional water harvesting structures like community ponds and tanks which have supported the communities through ages in periods of drought are also important water conservation structures, which should be rejuvenated. Rejuvenation of tanks and natural stream network will restore natural balance of hydrological cycle, rectify overexploitation and enable sustainable development. Roof top rainwater harvesting and recycling or re-use of treated waste waters are the other measures, highly effective to cope with increasing water demands in urban areas. This augments total water availability for use.

Crop planning, too, has important role in semi-arid areas for optimizing water use and maximizing agricultural production. Proper crop selection should be based on water availability, land capability and soil suitability.

Integrated watershed management and treatment is based on these principles and involve soil and water management, and crop planning.

There is no express provision in the Constitution of India to counter the problems of water conservation except Art 51-A (g) of the Constitution inserted by 42nd amendment in 1976, it facilitates a fundamental duty to citizen of India for environment sustenance and conservation of natural resources. Specific law has not been drafted till date to promote water conservations, rain water harvesting/ artificial recharge techniques. There is an urgent need to draft a comprehensive water law to promote water conservation and indigenous knowledge of rain water harvesting/ artificial recharge for the sake of next generations.

It is strongly suggest that the knowledge to conserve water, rain water harvesting/artificial recharge techniques must be spread among our younger generations to alive these practices/ indigenous techniques for future perspective and conserve water for next generations. I further suggest that our telecommunication and broadcasting system must be used properly to propagate indigenous knowledge to conserve water. N.C.E.R.T., C.B.S.E., State and Central Universities must develop a curriculum about water education; conservation of water resources with some practical activities books. These types of books must be prepared and strongly implemented for class V to X students of each and every boardto understand the true value of water conservation.

References

Davies, B.R. Thomas, M; Meador 1992. The ecological impacts of inter basin water transfer; and then threats to river basin integrity and conservation Aquat. Conserv : Mar. and Freshut. Ecoyst 2: 325-349

Deepak Kumar Das, 2006, Environmental Impact of Inter-Basin Water Transfer Projects : Some Evidence from Canada. Economic and Political weekly XLI (17) : 1703-1707.

Dinar, A; Wolf, A. 1997; Economic and Political Consideration in regional Cooperation Models. Agriculture and Resource Economics Review-April 22, 1977. pp. 7-22.

Dr. Durga Das Basu, Commentaries on the Constitution of India-Eight Edition Vol. 8

H.K. Saharay on the Constitution of India (An Analytic Approach)-Fourth Edn.

H.M. Seervai on Constitution of India 4th Edition 2007-reprint Vol-I-III- Appendix 1.

ICID. 2006, Experiences with inter-basin water transfers for irrigation, drainage and flood management Revised draft report of the ICID task force on inter-basin water transfers. New Delhi, India :International Commission on Irrigation and Drainage.

Jagdish Swaroop and L.M. Singhvi on Constitution of India-3rd Edn. Vol.-3

GopinathSaha, Water Security & Management of Water Resources-Department of Science & Technology Government of India.