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TITLE :Revival of Swadeshi Vedic and traditional wisdom of water  
management – An effective tool to mitigate water crisis.

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**ABSTRACT**

Water is life – a concept coined in the ancient Indian civilization. Indian vedic scriptures have described in detail the origin of water, its importance, quality and conservation. The medicinal aspect of water has been discussed in Rigveda and Atharv veda. Varahmihir's Vrihat Samhita is one of the best treatises on ground water hydrology. Varahmihir has narrated the art of finding water source in Drakarjal which is based on the presence of trees, rocks, termite and mounds etc. The knowledge of ecology confirms that the presence of some of the trees in the vicinity could be an indication of a ground water source. Water harvesting practices in India are well known. In our country, the largest state – Rajasthan had a very rich traditional, social and cultural heritage of conservation and judicious use of water that helped the mankind and the cattle to survive over the centuries against all odds of the trying environment. Various water harvesting structures and techniques like Nadi, Khadin, Talab, Johad, Bund, Kua, Sagar, Samand, Kund, Jhalra, Baori, Beri and Tanka etc. were practiced to suit particular site conditions. People managed the scarce water resources optimally to survive the often occurring drought conditions. Water has been paid high esteem in our culture in as much as it is regarded as "God". At innumerable places in Vedas and Upanishads happiness, vigor, and prosperity of mankind has been prayed to water God (Jal Devta). In Rajasthan, water had even higher status in all cultural and religious customs. Construction of well or establishment of a water hut was considered as a deed of dharma – biggest religious practice. All these practices were to pay respect and to conserve the precious commodity, which the Mother Nature had provided to the mankind. Due to unmanaged extraction of ground water and indifferent attitude towards the old wisdom the ancestors had for conservation, the present drinking water scenario is quite grim despite of pumping in heavy financial resources. It is quite heartening that the society and the government are now taking steps for reviving the old practices. In the present communication unique information pertaining to various issues of water as mentioned in Vedas, traditional and rain water harvesting system of Rajasthan, artificial recharge system and allied aspects will be discussed.

Vedas enunciates us that man must sustain his life with joy by means of inhaling fresh air, drinking wholesome and aesthetic water and eating pure and nutritive foods and fruits. This fact has been verified in Chandogyo-Panished ***βvkqkj 'kq)kS IRo 'kqf)P*** Water is an essence of life and thinking of possibility of life without water anywhere in the whole universe is just beyond imaginations. *Yajurveda* speaks about the importance of water that “anything we try to identify requires water and depends parasitically on water, to this indispensable part of our life”.

### **Water Supply in Ancient India**

*Acharya Bhrugo* has divided Shilpa Samhita into three chapters (namely Dhatukhand, Sadhankhand and Vastukhand). Agriculture, water and minerals are included in Dhatukhand.

***β/kkrwuka lk/kukuka p okLrwuka f'kYilafKre~ Nf" k ty [kfu'psfrP***

The knowledge of liquid materials starts with the commentary on the group of water, E.g., Samudram (sea water) was described as –

***βlkeqzaj rUu ikrO;a eklnk'o;qtkf}jukP***

All other kinds of water are called samudra (sea water), they should not be used for drinking except during asvayuja (September – October/Autumn season).

The classification of water described by *Acharya Wagbhatt* covers : rain water, contaminated water, sea water, warm water and coconut water.

In *Rigveda* and *Atharvaveda*, several verses are devoted to water and its utility.

***βvkiks fg" Bk Hk;ks Hkqo% Lrk u ÅtsZ n/kkru A***

***egs j.kk; p{kls A ;ks o% f'koreksa jllrL;***

***Hkkt;rsg u% A m'krhfjo ekrj% AAP***

O Waters ! You give happiness to mother earth, give us strength and grace. (O Waters !) You are beautiful. Kindly endow us with the best virtue (ras) you possess that would protect us like mother. You are created by the Almighty to destroy all the diseases. Please guide us in the cause of humanity. (O Waters !) We bow our head.

In the context of ancient times, in addition to impounded waters in ponds and lakes, the source of water supply, was a dug well. Water divining (dowsing technique) was in vogue and even today there are efficient water diviners whose success rate is over 90% in finding a water source.

*Varahmihir's Vrihat Samhita* is one of the best treatises on ground water hydrology. Releasing the water need for human consumption and agriculture of that time, *Varahmihir* has narrated the art of finding water source in Drakarjal which is based on the presence of trees, rocks, termite, mounds, etc. Today, the importance of trees for environmental protection has increased manifold. The importance of a tree is highlighted as follows :

***n'kdwi lekokih n'kokih leksàn%A***  
***n'kàn lekiq=ksa n'kiq=leknzqe% AA***

***1/0`{kk;qosZn1/2***

*Surpala*, the great Ayurveda physician states : Ten wells equal to one pond, ten ponds equal a lake, ten lakes are equivalent to a son while ten sons equal to a tree.

The knowledge of ecology confirms that the presence of some of the trees in the vicinity could be an indication of a ground water source. Though remote sensing, soil resistivity and other hydrological techniques are now practiced for finding a water source, the soil characteristics, presence of trees, shrubs are also considered even today. Acharya Varahmihir has categorized his contribution of Drakarjal in 124 verses in primarily three categories – Finding the source of water

(1) based on the knowledge of trees (2) colour of the mother earth and (3) presence of rocks.

***l'kdZjk rkezegh d''kk;a {kkja/fj=h dfiyk djksfr A***  
***vkik.Mqjk;ka yo.kaizfo''Ba] e''Va e;ks uhy olqU/kjk;ke~ AA***  
***1/0`gr~ lafgrk1/2***

The water beneath the soil bearing copper colour and with small pebbles tastes bitter. Water beneath the ash colour soil will be alkaline while under the light yellow soil the water will be salty. Water below light black or grayish soil will be sweet.

The Acharya has also realized the treatment of well water :

***vatueqLrks'khjS % ljktdks'kk r dkeydpw.ksZ %A***  
***drdQylek;qDrsS;ksZx% dwis iznkrO; AA***  
***1/0`gr~ lafgrk1/2***

Powder of Anjan (Hardwickia binata), Musta (Cyperus rotundus), Rajkoshatak (Andropogon muricatus), Torai (Luffa actungula), Amalak Emblicaofficinalis) should be mixed in well water -

***dyq''ka dVqda fojla] lfy ;fn ok'kqexfU/k Hkosr~ A***  
***rnusu HkoRley] lqjla] lqlqxfU/k xq.kkSjjS'p;qre~ AA***  
***1/0`gr~ lafgrk1/2***

The well water which is not clean, bitter in taste, alkaline, tasteless, or with foul smell will become clean, sweet, and will be full of many qualities.

The following verses are about purification of water –

***lw;Z vkRek txr% rLFkq''k'p A***

(Rigveda)

The sun is the heart of the whole world. We may thus argue that the interplay between algal bacteria in the presence of sunlight, viz. algal bacterial symbiosis, was probably to the ancient era.

***r= llr dyq”kL; izlknukfu HkofUr r|Fkk  
drd xksesnd fclxzfUFk ‘kSokyewyoL=kf”keqDrk ef.k’psfr  
1/4qJr~ lafgrk1/2***

There are seven ways to purify water – These include Katakfal (Nirmali seeds), Gomedak (A precious stone), Bisbranthi, Shaiwal (Algal), Vrikshmul (roots of a tree) and Muktamani (Jewels).

In this connection, the experiment conducted at NEERI, Nagpur in 1960s infers that the Nirmali seed (*Strychnos potaatorrum*) could be used as coagulant in water treatment. The concept remained unaltered however, the method of application on a large scale in the present times remains aluminum hydroxide.

It is interesting to mention that the whole process of water purification was given in the vedic literature. The Atharvaveda describe about the process of water purification using three pitchers. Containing sand and gravel in the first pitcher (for filtration and removal of bacteria), in the second pitcher coal (for adsorption) than the pure water is collected in the last pitcher. The Rigveda also mentions that-

***;klw jktk o:.kks ;klq lkseksfo’osnsok ;klwtZ enfUr A  
oS’okujks ;kLofXu% izfo”VLrk vkiks nsohfjg ekeoUrq AA***

(Rigveda 7 : 49 : 4)

Water can be purified by the purifying air, Sunrays or fire (temperature) and ions.

(Yajurveda)

***lforqoZ% izlo mRiqukE;fPNnzo ifo=s.k lw;ZL; jf’efe % A***

(Yajurveda 1.12.31)

Also describes about the natural purification of water by sunrays and Kusha (a type of grass).

### **Disinfection**

The ancient Indian knowledge based on antimicrobial properties of herbs available in nature was the first documented evidence on disinfection. The quest for pure water prompted the Rishis to search for suitable herbs available in nature. There is a need for R & D on the Indian knowledge base so that at least the rural population could derive advantage out of these efforts. NEERI, Nagpur has recently initiated probing studies on asserting the antimicrobial properties of some of the herbs mentioned in Vrihat Samhita.

Much currency has been given to alleged passages from the Sanskrit advising that water be treated by boiling and plunging hot metal into it. The maxim from Sanskrit of about 2000 BC states that the foul water be treated by boiling and dipping seven times a piece of hot copper into it and then filtering it.

Varahmihir, Susrut, Charak, the visionary physicians of that times had documented the use of copper, silver and herbs from natural vegetation as disinfectants even today, in some parts of India, water is stored in copper vessel overnight and then consumed the next day.

Forerunner of many “investigations of silver as a destroyer of water borne organisms was Carl Von Negeli”, a Swiss botanist. In 1880 he observed the disappearance of algae, particularly spirogyras, from water containing minute quantities of copper or silver or their salts. Dr. Negeli named the action of silver as Oligo dynamic. It is heartening to note that researchers in the west have confirmed the Indian hypothesis on disinfection of water.

### **Forgotten Practices**

Water has been paid high esteem in our culture in as much as it is regarded as God (Varun devta). In Rajasthan, water had even higher status in all cultural and religious customs. It was customary to worship water resource on auspicious occasions like birth and marriage. Like in temples, one was not allowed to enter the agor – catchment area of a water boy or the “parinda” – room in the house where water is stored with shoes off. Children were not allowed to touch water pitchers before attaining age by which they had learnt the hygienic practices of handling water and this was considered as an occasion of pride for the child. A pitcher full of water was considered as a good omen. When one entered a new house, a water pitcher was first installed. On all the occasions of prayer, Kalash – a small pitcher full of water had an essential place. There was hardly any folk song sung by ladies on religious and auspicious occasions that did not have respectful mention of water. Wastage of water was considered as a worse as a crime in the traditions. Construction of a well or establishment of a water hut was considered as a deed of dharma – biggest religious practice. All these practices were to pay respect and to conserve the precious commodity, which the Mother Nature had provided to the mankind in whatever quantity it may be.

### **Traditional Water Harvesting Structures**

Water harvesting has been an integral part of Indian traditions and is deeply rooted in the social fabric of Rajasthan. In ancient times, there were hardly any public sources of drinking water. Therefore, people largely had to fend for themselves. The local people have created numerous water bodies. There are various traditional water resource systems like Nadi, Talab, Johad, Bund, Sagar, Samand, Sarovar, Khadin, Jhalra, Baori, Beri and Tanka etc. Wells are another important water body. There are different types of wells practiced in Rajasthan.

A ‘Kua’ is a well owned by an individual, but a Kohar is a larger well owned by a community. Then there are step wells having access to water known as Baori and Jhalra. In western desert regions of the state, certain areas are known as Par where the flowing water accumulates and seeps into the earth. If a Beri

(shallow and narrow well, about 6 to 8 metre deep) were dug in it, sweet water would be found. Tanka is an under ground structure where polar (rain) water can be stored. The stored water in the tanka may last for a few months to three to four years without any deterioration of the quality.

### **Roof Top Rainwater Harvesting**

The State of Rajasthan particularly the *Thar Desert* was the pioneer in the origination of rain water harvesting structures as extreme climate events viz. aridity, drought are expected to leave an impact on human society. In the ancient times, the water harvesting system was in vogue, and the houses constructed with stone and lime were so structured that they had a self contained roof water harvesting system. The potential of rain water harvesting can be appreciated by taking case of a village situated in Barmer or Jaisalmer where average annual rainfall is 100 mm only.

Rain water Harvesting is the collection of rain water from the different areas like roof of the building, open spaces surrounding the building, farm areas etc. and then storing it for a later use or diverting it to an existing well for recharging. The rain water that fell on the roofs of the houses was taken through a conveyance system into an underground tanka (reservoir) built in the house or in the courtyard. The tanka would be as small as one metre square and 3 metre deep to as big as a room – one tanka was found to be about 6 metre deep, 4.3 m long and 2.4 m wide. In Rajasthan there would be hardly any fort or havelis (big houses) where one would not find reminiscent of roof top harvesting system.

### **Suggestive measures for Sustainable future.**

It has been realized that mankind is running fast on the dangerous tract of increased ground water extraction. Indiscriminate use of water and over reliance on the conventional piped water supply scheme forgetting the old wisdom of water harvesting. It has also been realized that if the same conditions prevail, we shall soon reach a point of no return.



Govt. of India and various State Governments have taken many actions like formulation of water policy, setting up committee for advising judicious use of water resources, shifting the ground water based schemes to surface water sources, reviving the traditional water harvesting structures and supplementing the piped water supplies with them and creating awareness among the stakeholders towards conservation. The role of P.R.L.'s and NGOs is widening so as to ensure involvement of the beneficiaries to strengthen the efforts.

Roof Top Rainwater Harvesting and Artificial Recharge of Ground Water are increasingly being promoted. Ground Water Department of Rajasthan is working on various options of artificial recharge like shaft and recharge bore, using abandoned tube wells and handpumps, recharge trench and recharge bore, storm water harvesting and using it for recharge etc.

### **Epilogue**

Mother Nature has provided the mankind a blessing in the form of water. The quantum of available water is limited. Our ancestors were very wise to realize this fact and devised methods and practices so as to conserve this scarce commodity; resulting thereby we were inherited with enough of the resources to survive. In the name of progress and greed of prosperity we have blindly over extracted the ground water, forgotten water harvesting practices, inculcated habits of excess use of water in domestic and agriculture purposes etc. It has deteriorated conditions on account of which the water resources are fast depleting. Therefore, it is exigence that we join hands together, to not only save whatever is left but to enhance it further so that we may also proudly transfer it to next generation in adequate quantity.