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EFFICIENT WATER MANAGEMENT: CHALLENGES AND INITIATIVES

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Abstract

Water is a primary requirement of men, animals, living creatures and plants communities. No life can be thought of on the earth without water. Absence of life in any form on other planets and satellites of the solar system is the non-availability of water in any form. Earth, on that account, is a wonder in the Universe. India is one of the countries of the world which, like others, has water as the main life supporting system.

India is a country whose economy even after 71 years of independence is dependent on agriculture and is likely to continue for years to come. At present, no doubt, Indian agriculture has attained self sufficiency in food, contributes 15 per cent towards export and provides employment to about 60 per cent working population. Thus it is apparent that India has achieved laudable success in agriculture and has transformed itself from the pitiable status of food importing to a food exporting country. But the pace with which the population of the country is growing, the future can not be predicted. Due to ever increasing demand for food the country is likely to face the problem of sustainability. It can not be denied that water has emerged as the most crucial factor for sustaining the agriculture sector in the coming years. Without adequate water for agriculture productivity, particularly that of food crops, can not be increased. Though, for the present, water resources in India seem to be adequate, but not inexhaustible. Days are not for off when there will be quest of water for survival. Someone has rightly remarked that "the future wars will be fought for survival. Someone has rightly remarked that" the future wars will be fought for water". What is actually needed is to plan water resources in such a way that its availability for drinking and agriculture purposes is maintained. For that purpose management of water resources is needed before it becomes too late.

The International Water Management Institute forecasts that if the present reckless use of water resources continues, by 2025, one-third of the Indian population will live under acute water scarcity condition. This is apparent from the fact that the per capita water availability has dropped drastically from 6,000 million cubic meters in 1947 to 2,200 million cubic meters now and is expected to decrease further to 1,450 million cubic meters by 2025. The requirement of water to different uses by 2025 is estimated to be 105 million hect. Meters, but the share of water is expected to reduce from the present level of 85 per cent to 71 per cent by 2025.

Need to protect water resources :

Keeping in view the dwindling water resources it is the need of the day to protect available water resources and their judicious use. The factors which warrant us in this regard are the following :-

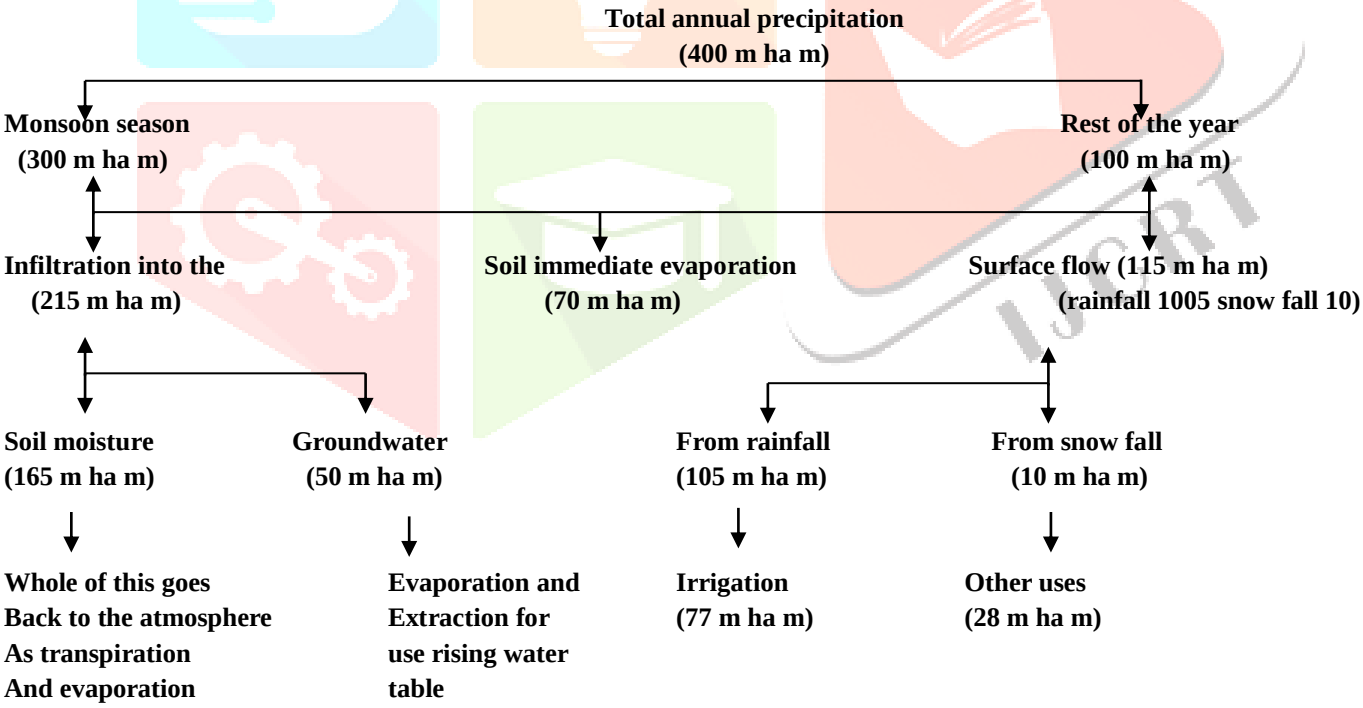
(i) Increasing Demand :

By 2050 the world population is expected to be near about 8 billion. Half of the world's population will live in countries facing water scarcity. As per the estimates of the Central Ground Water Board 15 states of India may face severe shortage of ground water if we continue to exploit it indiscriminately. We are already facing the problem of clean water for drinking purposes due to pollution and increasing competition from industrial use and irrigation. The demand for various sectors is going to increase tremendously by the middle of the present century as shown in the table below.

Projected Water Demand for Various uses In Million Cubic Meters

Uses	2010	2025	2050
Irrigation	688	910	1072
Drinking	56	73	102
Industrial	12	23	63
Energy	5	15	130
Others	52	72	80

Sources : *The India Infrastructure Report, 2011.*



(ii) Falling water table :

According to an estimate by the Ground Water Board water table in India is dropping by 6m. or more each year as rainfall is unable to recharge and replenish the used ground water. The consequence is that instead of a pair of bullocks water has to be drawn by pumps powered by electricity or diesel to irrigate fields of more water consuming crops like rice, sugarcane etc.

(iii) Weather Abnormalities :

The vagaries of monsoon like late onset, early arrival and withdrawal, prolonged dry spells or failure of the monsoon with little rain creating drought or flood conditions. The regional variation in rainfall with highest in Mawsynram and least in Western Rajasthan also create water problem due to improper management of water resources. Consequently, over the years water abundant regions have become water scarce regions and such water scarce regions face water famine.

(iv) High Dependence on Rain-fed Agriculture :

The rain-fed areas occupy 67.5 per cent of the cultivated land per cent of the cultivated land contributing 44 per cent of the food grains and support 40 per cent of the population and 66 per cent of the livestock. In the past decades that rate of growth of food production has kept pace with the population growth mainly due to high productive gains from irrigated areas. Though irrigation facilities have been extended to more areas, but half of the cultivated area will continue to remain dependent. It is, therefore, essential to improve the productivity level in the rain-fed areas, provided natural resources i.e. water and land are properly managed and conserved with the application of innovative technologies.

(v) Pollution of water bodies :

Almost all the water bodies throughout the country including rivers, canals, wetlands and tanks are severely polluted due to release of sewage and sludge and waste products from the industrial units. Thus water is becoming unfit for drinking purpose and irrigation. Besides, concentration of fluorides, chlorides, arsenic, selenium etc. Ground water has added even more problem for agriculture in dry regions.

All the above problems can only be solved by proper management of water resources before it is too late. It is there fore, suggested that there should be integrated water management approach lest the situation is out of control…….

Integrated water management approach :

The spatial and temporal variations in water resources availability pose great challenges for storing and regulating the use of water resources in the country. There is wide gap between the potential created and the utilization i.e. more than 10 million hect. Meters at any point of time. At present the need of the hour is not only the development of water resources but also their efficient management to meet the demands of water for agriculture use, drinking and industrial needs may be as below :

1. Interlinking of Rivers :

The idea of interlinking of river was first conceived by Sir **Arthur Colon** some ten centuries back. It was revived again a few decades ago independently by **M. Visveswarayya, K.L. Rao** and **D.T. Dastur.** Some four years back in response to the order of the Supreme Court of India the idea for interlinking the rivers at the cost of 5.6 lakh crores was revived again. The Govt. of India appointed a Task Force of scientists, engineers, economists, policy makers etc. to prepare a detailed project report. If this massive project it completed the following benefits will accrue to the country.

i. Nearly 35 million hects. of agriculture land can be brought under irrigation by using 173 million cubic meters of additional water resources created.

ii. Raise an ultimate irrigation potential from 113m. hects. to 148-150 million hectares.

iii. Transfer of water from surplus to deficit areas will help to solve flood and drought problems.

iv. There will be substantial increase in power production to the tune of 3 lakh. M.W.

2. Inter-basin Transfer :

The project was formulated by the National Water Development Agency (NWDA). As per the programme the project is divided into two broad components :-

i. The Himalayan component with 14 river links and

ii. The Peninsular components with 16 river links.

It is planned to transfer 141 cubic km/year through the Himalayan component essentially for re-distribution in the Ganga basin and the Western area.

3. Water Harvesting and Ground Water Recharge :

The ways of collecting rain water for various purposes is called water harvesting. It can be done in various ways :-

(i) Water Harvesting on Ground :

It is collection and storage of rain water from catchments and watersheds followed by subsequent use. Rain harvesting in any given area depends on the topography, soil type, depth and slope and vegetation cover. However, it may be more successful in areas where rainfall is sufficient. Recharge of ground water which is the concept of rain water harvesting utilizes the structures like pit, trenches, wells, check-dams, percolation tanks etc. The water thus harvested can be used for irrigation during the dry periods.

(ii) Roof-top Harvesting :

In this method like rain water from roof top is led into a tank through a pipe for meeting domestic needs. The building should be especially designed for this purpose and its roof be free from dust, pesticides or corrosive materials. Harvested rain water plays a greater role in sustaining surface water supplies on the one hand and recharge aquifers on the other. It also prevents the rain erosion.

(iii) Watershed Management :

Watershed is a natural geo-hydraulic unit. It is an area of land and water bounded by a drainage divide within which the surface run off collects and flows out of the area through a single outlet into a river or other body of water. It must be drought proof and capture each rain drop and save the crops, animals and human beings.

(iv) Recycling and Reuse of waste water :

Recycling means internal use of water by the original user prior to discharge. While reuse refers to waste water that is discharged from the houses, industries etc are withdrawn and diverted for irrigation water used for domestic purposes i.e. for washing, cleaning and bathing etc. should be collected, cleaned and recycled for non-drinking, domestic and industrial purposes, such as water be stored in tanks and ponds should be canalized.

As of now 75 per cent of the water is used for non-drinking purposes, it is proposed to supply water and non-drinking water separately. The latter may use harvested and recycled water.

Besides the above there is great need for :

(i) Improving water use efficiency through better technology.

(ii) Reducing seepage losses and desalting of tanks.

(iii) Arrest over exploitation of ground water.

(iv) Avoid all form of pollution and

(v) Revive Warabandi system.

In typical canal command areas the allocation of water on one week fixed rotational system is called Warabandi. This is its present form failed to fulfill the objective of equitable distribution of water due to non-consideration of seepage losses between source and tail end of water courses.

Conclusion :

In the present day when population is growing very rapidly water is becoming precious for survival. Therefore, every drop of water should be judiciously utilized and reckless use and wasting is to be averted. Human intervention is called for halting wastage and harness the surplus water to benefit the water stress regions. Unless water problem is tackled judiciously it will pose great problems to the generations to come and their existence itself may be threatened.

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