

## **Role of Water Resources Management for the Sustainable Development**

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### **Abstract :**

Today, majority of countries are placing unprecedented pressure on water resources. The global population is increasing fast, and estimates show that with current practices, the world will face a 40% shortfall between forecast demand and available supply of water by 2030. Furthermore, chronic water scarcity, hydrological uncertainty, and extreme weather events (floods and droughts) are perceived as some of the biggest threats to global prosperity and stability. The situation is constantly worsening. Some region suffer drought and some are facing floods. This can be overcome through proper resource management.

Keywords : Water, Resource Management, Sustainable Development.

### **Introduction :**

Water is an most important resource for all life on the planet. The water resource on Earth only three percent of it is fresh and two-thirds of the freshwater is locked up in ice caps and glaciers. The remaining one percent, a fifth is in remote, inaccessible areas and much seasonal rainfall in monsoonal deluges and floods cannot easily be used. As time goes, water is becoming scarcer and having access to clean, safe, drinking water is limited among countries. Currently only about 0.08 percent of all the world's fresh water is exploited by mankind in ever increasing demand for sanitation, drinking, manufacturing, leisure and agriculture. Due to the less percentage of water remaining, improving the fresh water we have left from natural resources has been a continuous difficulty in several locations worldwide.

Abundant effort in water resource management is directed at optimizing the use of water and in minimizing the environmental impact of water use on the natural

environment. The observation of water as an essential part of the ecosystem is based on integrated water resource management, where the quantity and quality of the ecosystem help to regulate the nature of the natural resources.

In Maharashtra some regions are draught hits and some region received excess water results in flood. This situation can be managed through effective water management.

### **Water Resources Management :**

Water resource management is the movement of planning, developing, distributing and managing the optimum use of water resources. It is a sub-set of water series management. Water is very vital for our survival. The field of water resources management will have to continue to acclimatize to the current and future issues facing the allocation of water. With the growing qualms of global climate change and the long term impacts of management actions, the decision-making will be even more difficult. It is likely that ongoing climate change will lead to situations that have not been encountered. As a result, substitute management strategies are sought for in order to avoid setbacks in the allocation of water resources.

For water as a resource, this is mainly difficult since sources of water can cross many national boundaries and the uses of water include many that are difficult to assign financial value to and may also be hard to manage in conventional terms. Examples include rare species or ecosystems or the very long term value of earliest groundwater reserves.

Water resource management is of paramount importance in agricultural development. Sustained socioeconomic development in countries with irrigated agriculture could be imperfect by water availability and deterioration in water quality. Consequently, any effort made to improve water use in irrigation practices will have a marked effect on sustainable agriculture and on conservation of soil and water resources.

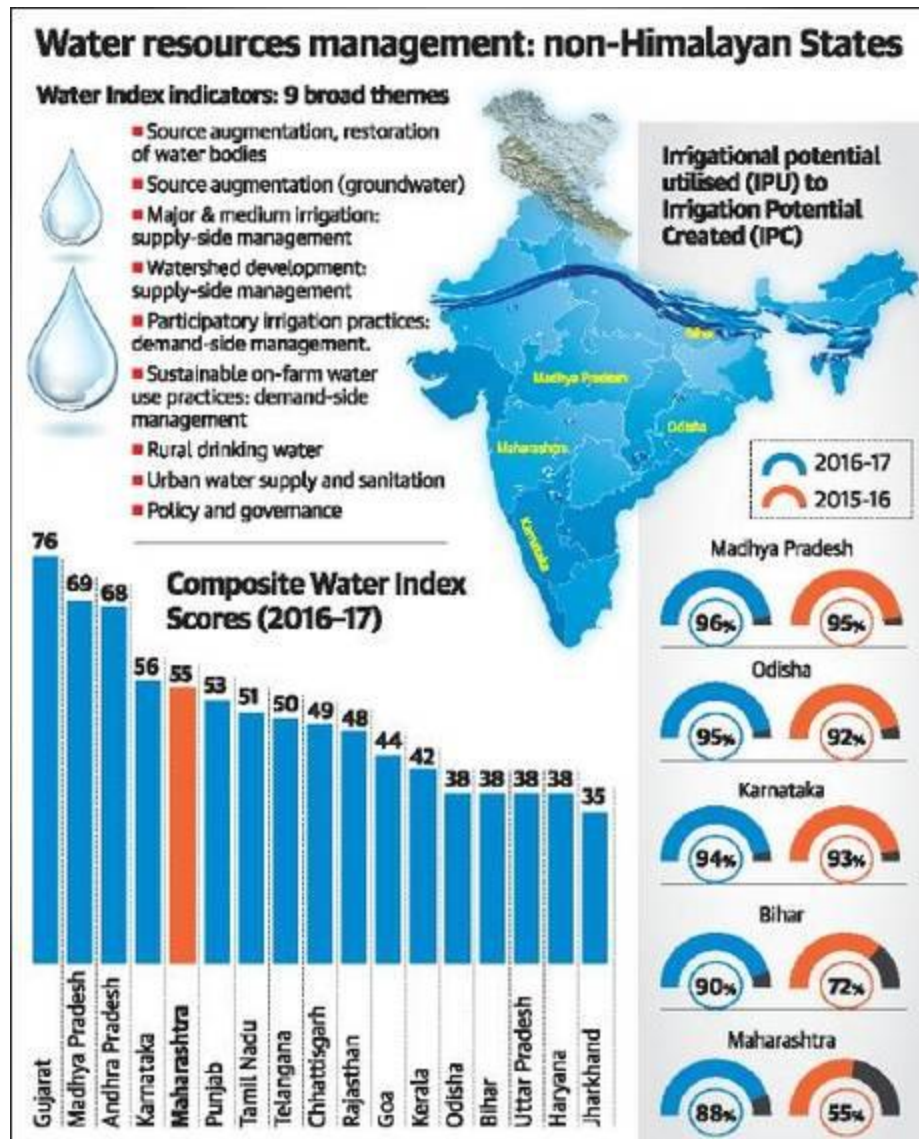
### **Condition of Water Resources in Maharashtra :**

The latest Niti Aayog report has presented a grim picture of Maharashtra's water management efforts with the State dropping lower in overall rankings. Released last

week, the Composite Water Management Index, has flagged worrying trends reflecting not only poor planning at the ground level but also policy omissions resulting in low irrigation potential, poor restoration of water bodies, average access to drinking water and treatment of waste, the report said.

The poor performance in most of the nine themes explored resulted in Maharashtra shedding a rank this time. From fourth place in 2015-16, the State is ranked fifth in FY17, behind Karnataka, Madhya Pradesh, Andhra Pradesh, and Gujarat at first place. The report is likely to be a setback to Chief Minister Devendra Fadnavis' plans to present Maharashtra as a leader in water management with the flagship Jalyukt Shivar Abhiyan promising to make the State drought-free by 2019. The Abhiyan was launched in 2016 with an aim to make 5,000 villages free of water scarcity every year.

Among the nine themes states were measured on, Maharashtra's score was the worst on the index of irrigation management. The State scored below the median score of 7.57 drawn up for 21 states that reported data for FY17. The report noted that the significant variation in scores was owing to "poor performance" of large states such as Maharashtra. "In fact, Maharashtra has the highest number of large dams in the country (2,354), but only 18% of the State is irrigated, indicating a wide gap between irrigation potential created (IPC) and irrigation potential actually utilised (IPU)," the report said. The report cited poor performance, the IPC-IPU gap and inadequate maintenance as the most pressing challenges in the irrigation sector in the country. Much of these were driven by a lack of capacity in state departments and inadequate collection of user fees to ensure maintenance of irrigation assets.



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## Role of Government in Water Management

In order to bridge the gap between irrigation potential created and its actual utilization and also to optimize the benefits from proper use of surface and ground water through an increased efficiency in distribution, delivery, application the state Government has taken a policy decision to provide legal support to irrigation management transfer to water users association. Accordingly the Maharashtra Management of Irrigation Systems by Farmers Act- 2005 has been enacted by the state legislature. It is an act to

provide for Management of Irrigation System by farmers & for matters connected therewith or incidental thereto.

The State Government has initiated several policies and administrative reforms for development in Water Sector. Due to above reform initiatives, irrigation potential to the tune of 4.33Mha is created by the end of June 2007 through 66 major, 233 medium and 2777 state sector minor irrigation projects. As a result of this, Government of Maharashtra has become first State in the country to meet out 100% O M expenses from water charges only. Initially in performance improvement in irrigation sector will go long way in making water sector of the State self-sufficient and sustainable one in years to come. The international commission on irrigation and drainage(ICID) has taken the cognizance of the reforms/ ingenuities in water resources sector and awarded "**Water save Award 2004**" to **Shri S. V. Sodal,Secretary (CAD)**, Water Resources Department ,Maharashtra .In compliance to the commitment in State Water policy about transparency in water use and to identify the areas of problems in seeking objectives of selected 252 projects in the state is in exercise since last 5 years. Use of benchmarking has conferred success in elevating this presentation level of irrigation projects. Increase in potential utilization from 1.708Mha to 2.764 Mha and revenue recovery from Rs.252 crores to 627 crores is significant achievement of water resources Department during last 5 years. In future there will be a shift of irrigation water management from Water Resources Department to water user associations. Benchmarking of water user association will also be supportive for performance evaluation and creating awareness amongst water management staff and office bearer of water user association.

### **Water Management Problems :**

Water resources planning and management activities are usually motivated, as they were in each of the previous section's case examples, by the realization that there are problems to solve and/or opportunities to obtain increased benefits by changing the management and use of water and related land resources. These benefits can be measured in many different ways. The best way to do it is often not obvious. Whatever way is proposed may provoke conflict. Hence there is the need for careful study and

research, as well as full stakeholder involvement, in the search for the best compromise plan or management policy.

Reducing the frequency and/or severity of the adverse consequences of droughts, floods, and excessive pollution are common goals of many planning and management exercises. Other reasons include the identification and evaluation of alternative measures that may increase the available water supplies, hydropower, improve recreation and/or navigation, and enhance water quality and aquatic ecosystems. Measurable system performance criteria can help one judge the relative net benefits, however measured, of alternative plans and management policies.

Some of the manifold purposes served by a river can be conflicting. A reservoir used exclusively for hydropower, or water supply, is better able to meet its objectives when it is full of water. On the other hand, a reservoir used solely for downstream flood control is best left empty so it can store more of the flood flows when they occur. A solitary reservoir serving all three purposes introduces conflicts over how much water to store in it and discharge from it, i.e., how it should be functioned. In basins where diversion demands exceed the available supplies, battles will exist over water allocations. Finding the best way to manage, if not resolution, these conflicts are reasons for planning.

#### **a) Too Little Water**

Issues involving insufficient supplies to meet demands can result from too little rain or snow. This type of situation happens in Marathwada Region of Maharashtra. They can also result from patterns of land and water use. They can result from growing urbanization, the growing needs to meet instream flow requirements, and conflicts over private property and public rights regarding water allocations. Other issues can involve transbasin water transfers and markets, objectives of economic efficiency versus the desire to keep nonefficient activities viable, and demand management measures, including incentives for water reuse and water reuse financing.

NGO like Pani Foundation through Water Cup competition are managing this type of situation in draught hit region.

## b) Too Much Water

Damage due to flooding is a direct result of floodplain development that is incompatible with floods. This is a risk various take, and indeed on average it may result in positive private net benefits, especially when public agencies subsidize these private risk takers who incur losses in times of flooding. In numerous river basins of developed regions, annual expected flood damages are increasing over time, in spite of increased expenditures in flood damage reduction measures. This is in part due to increased economic development taking place on river flood plains, not only of increased frequencies and magnitudes of floods.

The region of Konkan, Sanhyadri has too much water which need to be managed properly. The recent flood in 2019 impacted so much region of Kolhapur, Sangli, Satara, Ratnagiri, Gadchiroli etc..

This situation can be managed by proper linkages of rivers and dams.

## c) Too Polluted

Wastewater releases by industry and households can have considerable detrimental effects on water quality and hence on public and ecosystem health. Planning and management activities should pay attention to these possible negative consequences of industrial development and the intensive use and subsequent runoff of pesticides and fertilizers in urban as well as in agricultural areas. The polluted inputs can impact the water resources.

## d) Ecosystem Too Degraded

Aquatic and riparian ecosystems may be subject to a number of intimidations. The most important ones include habitat loss due to river training and reclamation of floodplains and wetlands for urban and industrial development, poor water quality due to discharges of pesticides, fertilizers and wastewater effluents, and the infestation of aquatic nuisance species. The ecosystem of every region should be protected like Kaas Pathar.

## **Planning for Water Management**

Planning (the formulation of development and management plans and policies) is an important and often indispensable means to support and improve operational management. Planning provides an opportunity to:

- assess the present state of the water resources and the conflicts and priorities over their use, formulate visions, set goals and targets, and thus orient operational management,
- provide a framework for establishing policy relevant research and public participation,
- increase the rightfulness, public acceptance of, or even support for how the resources are to be allocated or controlled, especially in times of stress, and
- facilitate the interaction, discussion, and coordination amongst managers and stakeholders, and generate a common point of reference—a management plan or policy.

Many of the concerns and issues being addressed by water resources planners and managers today are similar to those faced by planners and managers in the past. But some are different. Most of the new ones are the result of two trends: (1) a growing concern for the sustainability of natural ecosystems and (2) an increased recognition for the need of the bottom-up “grassroots” participatory approach to planning, managing, and decision-making.

Today planners work for economic development and prosperity as they did in the past, keeping in mind environmental impacts and goals as they have done in the past, but now recognizing ecological impacts and values as well. Water resources management may still be focused on controlling and mitigating the adverse impacts of floods and droughts and water pollution, on producing hydropower, on developing irrigation, on controlling erosion and sediment, and on promoting navigation, but only as these and similar activities are compatible with healthy ecosystems. Natural ecosystems generally benefit from the variability of natural hydrologic regimes. Other users prefer less variability. Most of the engineering infrastructure is operated so as to reduce hydrologic variability. Today water resource systems are increasing, required to provide rather than reduce hydrologic (and accompanying sediment load) variability.

Reservoir operators, for example, can adjust their water release policies to increase this variability. Farmers and land use developers must diminish rather than encourage land-disturbing activities. Floodplains may need to get wet occasionally. Rivers and streams may need to meander and fish species requiring habitats along the full length of rivers to complete their life cycles must have access to those habitats. Clearly these ecological objectives, added to all the other economic and environmental ones, can only compound the conflicts and issues with respect to land and water management and use.

So, how can we accomplish all this conflict and uncertainty? We know that water resources planning and management should be founded on sound science, efficient public program administration, and broad participation of stakeholders. Yet obtaining each of these three conditions is a difficult challenge. While the natural and social sciences can help us predict the economic, environmental, and ecological impacts of alternative decisions, those predictions are never certain. In addition, these sciences offer no help in determining the best decision to make in the face of multiple conflicting goals held by multiple stakeholders—goals that have changed, and no doubt will continue to change. Water resources planning and management and decision-making are not as easy as “we professionals can tell you what to do. All you need is the will to do it.” Very often it is not clear what should be done. Professionals administering the science, often from public agencies, nongovernmental organizations, or even from universities, are merely among all the stakeholders having an interest in and contributing to the management of water.

Each governmental agency, consulting firm, environmental interest group, and citizen typically has its own limitations, authorities, expertise and conflicts with other people, agencies and organizations, all tending to detract from achieving a fully integrated approach to water resources planning and management. But just because of this, the participation and contributions of all these stakeholders are needed. They must come together in a partnership if indeed an integrated approach to water resources planning and management is to be achieved and sustained. All views must be heard, considered, and acted upon by all involved in the water resources planning and management process.

Water resources planning and management is not simply the application and implementation of science. It is creating a social environment that gets all of us who should be involved, from the beginning, in a continuing planning process. This process is one of

- educating ourselves about how our systems functioning,
- identifying existing or possible options and opportunities for enhancement and resource development and use,
- resolving the unavoidable problems and conflicts that will result over who gets what and when and who pays who for what and when,
- making and implementing decisions, and finally of
- monitoring the impacts of those decisions.

This process is repeated as surprises or new opportunities or new knowledge dictates.

Successful water resources planning and management requires the active participation of all community institutions involved in economic development and resource management. This can begin at the local stakeholder level like Water Cup. In some regions, nongovernmental institutions have been instrumental in initiating and coordinating this process at local grassroots levels.

This type of planning and execution should be done from government to citizen level. All the citizen should participate in the water management process then only it become a success.

## **Conclusion :**

Water resource management is a most important concern from several angles such as development of water bodies for future, protection of available water bodies from pollution and over exploitation and to prevent disputes. A supreme issue is water-its availability, quality and management.

In today situation effective water resources planning and management is big challenge, and will be an increasing challenge into the predictable future. The water management is the need of hour it can be achieved through the people participation. Everyone should participate in the water management process and government

should plan for water properly and build a roadmap of activities to be done to save future. The proper water management can lead to the sustainable development.

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