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Policies Regarding Water Conservation in India

(Conserve Water, Conserve Life, Save Water, and it will Save You)

MATRAVI MISHRA
B.A. LL.B. (Hons.)
Batch: 2021-26
46021210033

SRM University Delhi-NCR, Sonepat (Haryana)
(Established under the Haryana Private University Act,
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Abstract:- India has 16% of the world's population and only 4% of the world's water resources. The water demand is expected to grow from 40 billion cubic meters (bcm) currently to around 220 bcm in 2025. Water is one of the most important inputs essential for crops. Both its shortage and excess affect the growth and development of the plants, yields, and quality of produce. A water crisis is underway and we don't have a single droplet to spare by setting up sewage treatment plants in gurugram, tata project is recycling wastewater and using the treated water for washing vehicles, cleaning garages, and gardening. And though the NTPC (Non-Technical Popular Categories) project in krishnapatnam, Andhra Pradesh, they are removing total dissolved salts from industrial wastewater. Recycling and reusing 26.7% of the water through on-site wastewater treatment facilities The most important step in the direction of finding solutions to issues of water and environmental conservation is to change people's attitudes and habits; this includes each one of us. The value of water is priceless.

I. INTRODUCTION

A. Background & History

In India water-related programs and policies started early used immediately after independence were the National rural drinking water program in 1969 the accelerated rural water supply program in the year 1972- 73 then in the year 1983 National water resource council was established but the first National water policy was adopted by the government of India was in 1987 by the ministry of water resources to cover the planning and development of water resources and their optimum its utilization. The policy was based on principles of conservation, protection, management, and regulation of the vital and stressed natural resource, which incorporated legislative and executive actions on various levels of governance on a water resource. in 1994 the 73rd constitutional amendment came into being which makes provisions for assigning the responsibility of providing drinking water to the Panchayati Raj institutions in the year 1999 there was the formation of a separate department of drinking water supply in the ministry of rural development of India reforms in the rural in the year 1999, sector adopted in the year 1999 sector reform project on the pilot basis the project in cooperated the community in planning implementation and management of drinking water related scheme.

B. Need for Water Policy

- To govern the planning and development of water resource and their optimum utilization.
- 80% of rural & urban domestic water supply is served by groundwater in India, which is the largest user of groundwater globally.
- These amendments are required because water resources are debilitating and depend upon the per capita demand requiring the need to make certain changes.
- There is again demand in 2019, there is a national water policy draft and a committee has been made to suggest the new major that can be taken under the new national water policy.
- Now, this water policy will develop the ministry of Jalsakhti this is separately.
- Recent estimates suggest that if the current pattern of demand continues, about half of the national water demand will remain unmet by 2030.
- With water tables falling and water quality deteriorating, a radical change is needed in the approach to water management.

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C. Issues in National Water Policy:

➢ *Demand Management:-*

- The policy recognizes limits to endlessly increasing water supply and proposes a shift towards demand management.
- Irrigation:
- Irrigation consumes 80-90 percent of India's water, most of which is used by rice, wheat, and sugarcane.
- Without a radical change in this pattern of water demand, the basic water needs of millions of people cannot be met.

➢ *Groundwater:*

- The NWP gives the highest priority to the sustainable and equitable management of groundwater. Participatory groundwater management is the key. Information on aquifer boundaries, water storage capacities, and flows provided in a user-friendly manner to stakeholders, designated as custodians of their aquifers, would enable them to develop protocols for the effective management of groundwater.

➢ *River:*

- The water policy has seen rivers primarily as a resource to serve economic purposes. While acknowledging their economic role, the NWP accords river protection and revitalization prior and primary importance. The NWP outlines a process to draft a Rights of Rivers Act, including their right to flow, to meander, and to meet the sea.

➢ *Water Quality:*

- The new NWP considers water quality as the most serious unaddressed issue in India today. It proposes that every water ministry, at the Centre and states, include a water quality department.
- Rivers are drying up because of the over-extraction of groundwater, which reduces the base flows needed for rivers to have water after the monsoon.
- Dealing with drinking water and irrigation in silos has meant that aquifers providing assured sources of drinking water dry up because the same aquifers are used for irrigation, which consumes much more water. And when water and wastewater are separated in planning, the result is a fall in water quality.

D. Suggestions

➢ *Demand Side Options:*

- Crop Diversification:
- Thus, crop diversification is the single most important step in resolving India's water crisis.
- The policy suggests diversifying public procurement operations to include Nutri-cereals, pulses, and oilseeds.
- The incentive to farmers, also:
- This would incentivize farmers to diversify their cropping patterns, resulting in huge savings of water.
- Reduce-Recycle-Reuse:
- It has been proposed as the basic mantra of integrated urban water supply and wastewater management, with the treatment of sewage and eco-restoration of urban rivers stretching, as far as possible through decentralized wastewater management.
- Use treated wastewater:
- All non-potable use, such as flushing, fire protection, and vehicle washing must mandatorily shift to treated wastewater.

➢ *Supply Side Options:*

- Water to reach farmers and low-cost irrigation:
- The NWP points to trillions of liters stored in big dams, which are still not reaching farmers, and explains how the irrigated areas could be greatly expanded at a very low cost by deploying pressurized closed conveyance pipelines, combined with Supervisory Control and Data Acquisition (SCADA) systems and pressurized micro-irrigation.
- Steps to restore river flows include:
- Re-vegetation of catchments,
- regulation of groundwater extraction,
- river-bed pumping, and mining of sand and boulders.

➢ *Water Quality:*

- The policy advocates the adoption of state-of-the-art, low-cost, low-energy, eco-sensitive technologies for sewage treatment.
- Widespread use of reverse osmosis has led to huge water wastage and adverse impacts on water quality.
- The policy wants RO units to be discouraged if the total dissolved solids count in water is less than 500mg/L.
- It suggests a task force on emerging water contaminants to better understand and tackle the threats they are likely to pose.

E. Statement of problem:-

- India accounts for about 2.45 % of the world's surface area and about 4 % of the world's freshwater resources, ranking it among the top ten water-rich countries. Despite this, according to the 4th Assessment of the Inter-Governmental Panel on Climate Change, India has been designated a Water Stressed Region. The per capita availability of water, in India as a whole, is reducing progressively due to the increase in population. As per the census 2001, the per capita availability of water was 1,816 cubic meters which decreased to 1,545 cubic meters as per the 2011 census. The per capita water availability in 2015 was 1,720.29 cubic meters. India is in 133rd place in the world in terms of per capita water availability. Global water demand has been increasing at a rate of 1 % per year. India occupies first place in the world in terms of irrigated areas. One-eighth part of the country is flooded and one-sixth is drought-prone variations. The nature of the monsoon is responsible for all these. Constitutional Provisions Regarding Water Resources Water in Concurrent List:-Article 248 and Article 262 of the Indian Constitution are related to water resources in India. The responsibilities of the center and the states are as follows :
- Union List (Entry 56) Regulation and development of interstate rivers and river valleys under the control of the Central Government.

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- State List (Entry 17): Under this, the state governments have full jurisdiction to do related work such as water supply, irrigation, drainage and dam, reservoirs, and hydropower but it is subjected to the provisions of entry 56 in the union list.
- Article 262 of the Indian constitution relates to Inter-State water disputes. The water found on the Earth's surface is called Surface Water. It includes rivers, ponds, canals, etc. Surface water is replenished naturally by precipitation and lost through evaporation, groundwater recharge, etc. However, rivers comprise the most important source of surface water. About two–thirds of India's total surface water flow into three major rivers like Indus, Ganga, and the Brahmaputra. All three rivers have high annual water flow.
- Groundwater is water that is found below the surface of the earth. It is usually passed down through, the soil or the pores in the rocks. The speed at which groundwater flows depends on the porosity of the soil or the rocks. Uttar Pradesh is the most prosperous state in rechargeable water resources.
- Atalbhujalyojana aims at sustainable groundwater management with community participation in specific over-exploited and groundwater-stressed areas in seven states viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh.
- It is a central sector scheme with a total outlay of Rs. 6,000 crores and will be implemented with the assistance of the world bank. As per April 2015 report, the water resource potential or annual water availability of the country, in terms of natural runoff in rivers is about 1,869 billion cubic meters (BCM)

F. Significance of the Study:-

- This mission is governed by the ministry of water Resources, river development, and Ganga rejuvenation which is now known as the Ministry of Jal Shakti after its merger with the ministry of drinking water and sanitation. Ensuring integrated water resource management. Increasing water use efficiency by 20% through regulatory mechanisms with differential entitlements and pricing. Ensure that the water needs of urban areas are met through the recycling of wastewater. Adoption of new and appropriate technologies such as low-temperature desalination technologies that allow for the use of ocean water. Incentive structures will be designed to promote water-neutral or water-positive technologies, recharging of underground water sources, and adoption of large-scale irrigation programs which rely on sprinklers, drip irrigation, and ridge and furrow irrigation. Promotion of water purification techniques. More focused attention to over-exploited areas. Research in water use efficiency in industry, agriculture, and domestic sectors.

G. Research methodology:-

- Since the nature of the research paper is theoretical, hence the data has been collected through secondary sources, for example, internet sites, journals, etc. have been widely consulted to develop the plan of the research paper.

H. The objective of research:-

- The objective of this research is to learn and find out the solutions to the problems regarding water conservation policies. the main aim of the research is to find out all the facts and data on water resources and others, To gain familiarity with a phenomenon, or to achieve new insights into it.

I. Characterization:-

- The year 1983 National water resource council was established but the first National water policy was adopted by the government of India in 1987 by the ministry of water resources to cover the planning and development of water resources and their optimum utilization.
- 2002: the revised and updated national water policy,2002 was adopted by the national water resources council on 1st April 2002. The policy emphasized artificial recharge of groundwater, water conservation in-house and traditional conservation program with rooftop conservation, and desalinization of brackish water in the coastal region to convert it into fresh water using low-temperature techniques and traditional methods of recharging groundwater. the shift from supply-driven to demand-driven, centralized to decentralized implementation, and the government's role from service provider to facilitator. It was linked to the Rajiv Gandhi National Drinking water mission (RGNDWM) program and provided safe water to a village that did not have adequate sources of safe water. It also tries to improve the level of services for villages that were earlier partially covered in village handpumps that were financially incentivized by the swajaldhara, based on the adoption of a demand-responsive approach with community participation. Under the scheme management of water supply and sanitation became the responsibility of Panchayati Raj and local government bodies. An important element of this program was to contribute to the cost of providing safe drinking water. During this period national water policy was also linked to the millennium development goals (MDGs) under which the proportion of people without sustainable access to safe water was also targeted.
- The 2002 policy also has several debatable elements and some positive changes that were not present in earlier policies. But, these elements still, were not adequate to resolve and prepare the ground that can tune in with 21st-century management of water resources.
- 2005: India launched the Bharat Nirman program with an emphasis on providing drinking water within 5 years.
- From 2009 onward, it was renamed the national rural drinking water program (NRDWP). Right now the ministry of drinking water sanitation administers the National Rural Drinking Water Programme (NRDWP), and it extends its support to the states for implementing rural domestic water supply schemes., Activities like, the water quality monitoring and surveillance program, management information system, and Capacity and Communication Development Unit (CCDU) all were brought under the umbrella of NRDWP. Despite the combined efforts of both the Centre and the States of

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investing more than Rs 1, 35,000 crores, the goal of providing safe and adequate domestic water to every rural person in the country to date is not been fully achieved.

- 2008: The National Water Mission is one of the eight missions in the National Action Plan on Climate Change to tackle the threats of global warming. The objective of the National Water Mission is " conservation of water, minimizing wastage and ensuring its equitable distribution both across and within States through integrated water resources development and management".
- Five goals identified in the National Water Mission were Maintenance of a comprehensive water database in the public domain and assessment of the impact of climate change on water resources Promotion of citizen and state actions for water conservation, augmentation, and preservation. Focused attention to vulnerable areas including over-exploited areas.
- Increasing water use efficiency by 20%. The Command Area Development & Water Management (CADWM) was implemented. Micro irrigation like drip and sprinkle irrigation was emphasized which also saves water. Promotion of basin-level integrated water resources management.
- 2012: The Ministry of Water Resources has formulated the Draft National Water Policy in consultation with the National Water Board (NWB) and National Water Resource Council (NWRC). The 2012 water policy introduces the pricing mechanism for the overuse of water.
- It introduces a plan to levy tariffs for all water uses including irrigation if it exceeds a predetermined quota on a volumetric basis. To execute this, State Water Regulatory Authority was established in every state which will fix and regulate the water rates. Responsibility for Tariff collection, fixing rates and water distribution remains with Water Users Association (WUA) in states.
- It calls for a common integrated perspective to govern the planning and management of water resources. Such a perspective would consider local, regional, and national contexts and be environmentally sound. As per the policy, water needs to be managed as a community resource under the State.
- The principle aims are using scientific inputs from research for better agriculture strategies for the management of soil, plant, energy, and water and had some the soil and water productive along with managing brought a principal was laid down to cover and Paradise the allocation of water the policy was late on the water on the basis for priority as follows drinking water, irrigation, hydropower, navigation, industrial and other uses policy this policy is the debate of privatization of basic necessity like water which is directly associated with the right to life.
- The policy was put in the public domain to enlist suggestions from a wide spectrum. The privatization of water started a new debate in the country about whether water should be charged or not. The arguments made for the pro-privatization of water are that excessive usage of water in irrigation and conservation of water can only be checked through tariffs as water is a limited natural resource.
- The excessive subsidy on electricity has led to the extreme exploitation of water for irrigation in the Green revolution belt. Privatized utility charges encourage investments, bring new technologies, and improve services and water quality. The argument made against the privatization of water suggests that it does not serve the public and increases the vulnerability of the poor.
- It may also give the right to private Businesses to utilize water sources that are allocated for rural community puzzles for irrigation it can also be stated that with growing organization industrialization there is a going demand for water in cities with high purchasing power will have more access to water for themselves living rural India poverty strict in terms of water also. In my opinion, water is a basic element that must not be privatized as it is fundamental for life and health. The water right is essential to living a life of human dignity it is a condition for achieving all other human rights it must be treated as social and cultural rather than economic good.
- 2014: The government of India, Flagship Programme," NamamiGangeProgramme " was started to accomplish the twin objectives of effective reduction of pollution, conservation, and rejuvenation of the National River Ganga. River Ganga and Yamuna recently got the status of living entities by the High court of Uttarakhand to protect these rivers.
- 2016: In the year 2016, the government placed National Water Framework Bill (NWF), and then public comments were invited for the same. The draft National Water Framework Bill defines " water for life " as one of the core requirements for the " fundamental right of life of each human being, including drinking, cooking, bathing, sanitation, personal hygiene, and related personal and domestic uses ". It states that water shall not be denied to anyone on the ground of inability to pay. It also includes water needed for the sustenance of domestic livestock and the requirement for women " for their special needs ". The Water Resources Ministry invited comments and suggestions on the draft from the public after the draft law had been taken as model legislation that can be adopted by states.
- Interlinking of river program the idea of interlinking the river is very old British wanted to interlinking rivers for the cheap transportation of raw materials it was sir Arthur cotton's vision to link the Ganga and Kaveri to improve connectivity for navigation purposes.
- It got a push in 1982 when National Water Development Agency (NWDA) was established as an autonomous body to carry out the water balance and feasibility studies of the river linking program. NWDA identified 14 links under the Himalayan Rivers Component and 16 links under the Peninsular Rivers Component for inter-basin transfer of water based on field surveys and investigation and detailed studies.
- However, Not much progress was made later the project was put on hold going to inter-state disputes and opposition from farmers tribal groups civil society, and

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environmentalists in the year 2012 supreme court directed the ministry of water resources to constitute an expert committee to pursue the matter with the state government. The mission of this program is to ensure greater equity in the distribution of water by enhancing the availability of water in drought and rain areas.

- Recently interlinking of river programs has once again become a matter of national importance and has been taken up on high priority it got a boost with the successful linking of Godavari and Krishna in the year 2015 and Shipra and Narmada interlink in 2016 benefiting the people of Dewas district in Madhya Pradesh.

J. Interlinking of River Programme:

➢ *Advantages of Interlinking :*

- Would address the issues arising due to the variability of rainfall.
- Helpful in flood and drought aversion.
- Improve irrigation facilities and hence agricultural
- productivity.
- Job creation and Inland waterways.

➢ *Disadvantages of Interlinking :*

- Would affect the environment, ecology, and marine life.
- Displace people
- Would cause a problem if case river changes its course.
- And challenges of river interlinking, we can say that there is a topographical difference between the democratic plane and the peninsular plateau due to which water needs to be pumped up to establish a link between low setting into Gangetic rivers and high setting peninsular rivers water its taste like Assam Sikkim and Kerala sector do not want to share the water and Hess opposite the idea as if want the exclusive right to use their water resources.
- National Water Policy, 1987
- The national water resource council adopted the first national water policy in its 2nd meeting held in Sept.1987

II. NEED FOR A NATIONAL WATER POLICY

- Water is a prime natural resource, a basic human need, and a precious national asset, planning, and development of water resource need to be governed by a national perspective.
- The approach to the management of drought and flood have to be coordinated and guided at the national level.
- Planning and implementation of irrigation or multipurpose project at the state level, involve several issues such as environmental protection, and rehabilitation of project-affected people, the problem of water logging and soil salinity have emerged, and all these problems need to be tackled based on common policies and strategies.
- Water is needed for the production of food grain, drinking water domestic and industrial purposes, sanitation facilities, for hydro and thermal power generation. For all of these reasons equal policy, and strategy are needed.
- Another is water quality, improvement in existing strategies, innovation of new techniques, and strong science and technology will be needed to eliminate the pollution of surface and groundwater resources.
- The need for a national water policy is thus abundantly clear, water is a scarce and precious national resource, that needs planning developed, and conservation.
- The necessity for an apex body to evolve national policies for the development and use of water resources was emphasized by authorities including the irrigation commission, national commission of agriculture, and Rashtriyabarhayog.
- The national water resource council (NWRC) was set up on 10th march, 1983, under the chairperson prime minister of India and vice chairperson of the union minister of irrigation.

III. INFORMATION SYSTEM

- The prime requisite for resource planning is a well-developed information system.
- A standardized national information system should be established with a network of data banks and databases, integrating and existing central and state-level agencies, improving the quality of data and processing capabilities.
- Duplication in data collection should be avoided.
- The system should also include the projection of future demands for water for diverse purposes.
- MAXIMIZING AVAILABILITY:-
- The water resource available to the country should be brought within the category of utilizable resource to the maximum possible extent.
- Resources planning of water has to be done for a hydrological unit, such as drainage basin as a whole or as a sub-basin
- Development projects and proposals should be formulated by the state for basin or sub-basin.
- An appropriate organization should be established for the planned
- Development and management of a river basin as a whole.
- Water should be made available to water short areas including transfer from one river basin to another based on a national perspective, according to the requirement of the area.
- Recycling and reuse of water are also a part of water resource development.

IV. PROJECT PLANNING

- Planned as a multipurpose project.
- The project should provide for irrigation, flood mitigation, hydroelectric power generation, navigation, pisciculture, and drinking water.
- Study of the impact during construction and later on human lives, settlement occupation, economic and other aspects should be a component of project planning.
- Preservation of the quality of the environment and ecology should be a primary consideration.
- Adverse impacts on the environment should be minimized and should take adequate compensatory measures.

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- There should be an integrated and multidisciplinary approach to the planning. formation clearance and implementation of the project including catchment treatment and management, environmental and ecological aspects, rehabilitation of affected people, and development of the command area.
- Should pay special attention to the needs of scheduled castes and scheduled tribes and other weaker sections of society.
- Planning of projects in hilly areas should take into account the need of this area according to physical features.

V. MAINTANENCE AND MODERNISATION

- Structure and system created through massive investment.
- Appropriate annual provisions should be made for this purpose in the budgets.
- Regular monitoring of structure and system, necessary rehabilitation, and modernization programs should be undertaken.

VI. SAFETY OF STRUCTURE

- There should be proper organizational arrangements at the national and state level for ensuring the safety of storage dams and other water-related structures.
- Central guidelines should be kept under constant review and periodically updated.
- Continuous surveillance and regular visit by the expert should be needed.

VII. GROUNDWATER DEVELOPMENT

- There should be a periodical reassessment on a scientific basis of the groundwater potential and quality of the water available and economic viability.
- The exploitation of groundwater resources should be regulated so as not to exceed the recharging possibilities.
- Integrated and coordinated development of surface water and groundwater and their conjugative use should be envisaged right from the project planning stage.
- Over-exploitation of groundwater should be avoided near the coast to prevent the ingress of seawater into sweet water aquifers.
- WATER ALLOCATION PRIORITIES:-
- Should be broad as follows:-
- Drinking water
- Irrigation
- Hydropower
- Navigation
- Industrial and other use.
- DRINKING WATER:-
- Adequate drinking water facilities should be provided to the entire population both in urban and rural areas by 1991.

VIII. IRRIGATION

- Irrigation planning in a basin should take into account the variability of land, cost-effective irrigation options from all available sources of water, and appropriate irrigation techniques.
- Water allocation in an irrigation system should be done with equity and social justice.
- Have to ensure that the irrigation potential created is fully utilized and the gap between the potential created and its utilization is removed.

IX. WATER RATES

- Water rates for surface water and groundwater should be rationalized with due regard to the interest of small and marginal farmers.
- Participation of farmers and voluntary agencies
- Farmers should be involved in water distribution and collection of water rates.
- Voluntary agencies should be enlisted in educating the farmer about efficient water use and water management.

A. Water quality:-

- Surface water and groundwater should be regularly monitored for quality.

B. Water zoning:-

- There should be a water zoning of the country and economic activities should be guided and regulated by such zoning.

C. Conservation of water:-

- Conservation should be promoted through education, regulation, incentive, and disincentives.
- Flood control and management:-
- Watershed management through extensive soil conservation, catchment area treatment, preservation of the forest, increasing the forest area, and construction of a dam should be promoted to reduce the intensity of floods.
- Flood forecasting should be established for timely warming.
- Physical flood protection works like embankments and dykes will continue to be necessary.

D. Land erosion by sea or river:-

- Erosion of land by the sea in a coastal area or by river water inland should be minimized by effective measures.
- Sates and union territories should also undertake all requisite steps to ensure that indiscriminate occupation and exploitation of coastal strips of land are discouraged.

E. Drought management:-

- Drought-prone areas should be made less vulnerable to drought-associated problems through:-
- Soil moisture conservation measures.
- water harvesting practices
- Minimization of evaporation losses
- The development of groundwater potential.
- Transfer of surface water from a surplus area to where feasible and appropriate.

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F. Science and technology:-

- For effective economical management of our water resources, the frontiers of knowledge need to be pushed forward in several directions by research efforts in various areas including the following:-
- Hydrometeorology
- Assessment of water resource
- Snow and lake hydrology
- Groundwater hydrology
- Prevention of salinity ingress
- Water harvesting
- Evaporation and seepage loses
- Crops and cropping system
- Sedimentation of reservoirs
- The safety and longevity of water-related structures
- River morphology and hydrology
- Soil and material research
- Better water management practices.

➢ *NATIONAL WATER POLICY 2002:*

- Water is one of the most important substances for life on earth to function. While water is a renewable resource. Over the year the water demand has increased. To solve this problem government of India introduced the national water policy in 2002.
- The national water policy 2002 introduced modification/addition/ alteration about various issues namely information systems, water resources planning, institutional mechanism, project planning, private sector participation, water quality, monitoring of the projects, water sharing /distribution amongst the states, performance improvement, maintenance and modernization, safety of structures, land erosion by sea or river, conservation of water in comparison to national water policy -1987.

X. NEED FOR NATIONAL WATER POLICY

- Problems of water logging and soil salinity has emerged in some irrigation command degradation of agricultural land. There has been exploitation of groundwater resources in a certain part of the country. All these problems are addressed by common policies and strategies.

XI. WATER ALLOCATION PRIORITIES

- In the planning system, water allocation priorities should be broad as follows:-
- Drinking water
- Irrigation
- Hydro-power
- Agro and non-agro industries
- Every drop should be counted as annual water availability per person in India in cubic meter units in 2001 if we have 10.82 cubics or we can say 1820 cubic meters of water it will decrease in 2011 as 1545 cubic meters of water and in 2025 it will be 1341 cubic meters and in 2050 it will be 1140 cubic meters only.

XII. SOME OF THESE ARE HIGHLIGHTED BELOW

- Standards for coding, classification, processing of data, and methods/procedures for its collection should be adopted.
- Non-conventional methods for utilization of water:-
- Inter-basin transfer
- Artificial recharges of groundwater
- Desalination of brackish or seawater.
- Traditional water conservation methods:- Rainwater harvesting including rooftop rainwater harvesting. Need to be practiced to further increase the utilizable water resource. Research and development for these techniques are necessary.
- To give effect to the planning, development, and management of the water resources on a hydrological unit basis, along with a multi-sectoral, multi-disciplinary, and participatory approach as well as integrating quality, quantity and the environmental aspects, the existing institution at various levels under the water resources sector will have to be appropriately reoriented/reorganized and even created wherever necessary.
- Irrigation is the largest consumer of fresh water, the arm. should be to get optimal productivity per unit of water. Scientific water management, farm practices, and sprinkler and drip system of irrigation should be adopted wherever feasible.
- Reclamation of water-logged / saline-affected land by scientific and cost-effective methods should form a part of the command area development program.

A. Management of the water resource:

- Should incorporate a participatory approach.
- Involve not only the various governmental agencies but also the users and other stakeholders, in various aspects of planning, design, development, and management of the water resource scheme.
- Necessary legal and institutional changes should be made at various levels for ensuring an appropriate role for a woman.
- Water users association and local bodies such as municipalities and gram panchayat should involve in the maintenance and management of water infrastructures at the appropriate level.

B. Private sector participation

- Private sector participation should be encouraged in planning, development and
- management of water resources projects for divers wherever feasible
- May help in introducing innovative ideas, generating financial resources, introducing corporate management, improving service efficiency, and accountability to a user.
- Effluents should be treated to acceptable levels and standards before discharging them into natural streams.
- Minimum flow should be ensured in the perennial streams for maintaining ecology and social considerations.

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- The principle of 'polluter pays' should be followed in the management of polluted water.
- Measures like selective linings in the conveyance system, modernization and rehabilitation
- of existing systems including tanks, recycling and re-use of treated effluents, and adoption
- of traditional techniques like mulching or pitcher irrigation and new techniques like drip and
- sprinkler may be promoted, wherever feasible.
- Close monitoring of projects to identify and adopt timely measures to
- obviate time and cost overrun should form part of project planning and execution.
- The water sharing /distribution amongst the states should be guided by a national
- Perspective with due regard to water resources availability and needs within the river
- Basin necessary guidelines, including for water-short states even outside the basin, need
- To be evolved for facilitating future agreements amongst the basin states.
- The inter-state water disputes act of 1956 may be suitably reviewed and amended for
- Timely adjudication of water disputes referred to the tribunal.
- NATIONAL WATER POLICY 2012:-

C. Background:-

- The ministry of water resources published its draft national water policy 2012, on June 7, 2012.
- Draft policy seeks to address issues such as the scarcity of water, inequities in its distribution, and lack of a unified perspective in planning, management, and use of water resources.
- The draft NWP was placed before the national water board and national water resource council in Feb. 2012.
- It was finalized and adopted by the national water resource council on Aug. 9, 2012, and is under deliberation by the national water board.

XIII. PRINCIPLE

- The principle of equity and social justice must inform the use and allocation of Water.
- A common integrated perspective should govern the planning and management of water resources and that would consider local, regional and national contexts and have an environmentally sound basis.
- Water needs to be managed as a common communication
- resource, held by the state under the public trust doctrine to ensure equitable and sustainable development for all.
- Water may be treated as an economic good to promote its conservation and efficient use after basic needs. Basin should be considered the basic hydrological unit for this policy.

A. Water Framework law:

- A framework law must recognize water not only as a scarce resource but also as a substance of life and ecology.
- Groundwater needs to be managed as a community resource, held by the state under the public trust doctrine
- There is a need for comprehensive legislation for the optimum development of interstates river and river valleys.

B. Adaptation of Climate Change:-

- Increasing water storage in the form of soil moisture, ponds, groundwater, and small and large reservoirs.
- Enhancing the efficiency of water use through the adoption of agricultural strategies, and cropping patterns.
- Improved water application methods, such as land leveling and drip sprinkler irrigation should be adopted.
- Stakeholders' participation in land soil water management to evolve different agricultural strategies, reduce soil improve soil erosion and fertility.
- Incorporating strategies in water resource structures (Dam, flood embankment, tidal embankment.)
- Enhancing Water Available for use:
- Rainfall needs to be used directly and inadvertent evaporation of water needs to be avoided.
- Aquifers need to be mapped to know the quantum and quality of groundwater resources.
- Declining groundwater levels in the over-exploited area need to be arrested by improved technologies of water use.
- An artificial recharging project should be undertaken.
- Interbasin transfer of water from the surplus basin to the deficit needs to be encouraged.
- Integrated watershed development activities with a groundwater perspective need to be undertaken
- An existing program such Mahatma Gandhi National Rural Employment Guarantee act may be used by farmers to harvest rainwater using a farm pond.

XIV. DEMAND MANAGEMENT AND WATER USE EFFICIENCY

- System to benchmark water use such as water footprints
- (total volume of water in an area to produce goods and services) and water auditing needs to be developed
- Methods to encourage water saving include aligning cropping patterns with natural resource endowments, and micro-irrigation evaporation transpiration reduction.
- Small local-level irrigation through small bunds, and field ponds, need to be encouraged.

XV. WATER PRICING

- A water regulatory authority should be established.
- The water charger should be determined on a volumetric basin.
- Recycling and reuse of water should be incentivized through a properly planned tariff system.
- Water user association (WUA) should be given statutory power to collect and retain a portion of water charges

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manage the volumetric quantum and maintain the distribution system.
- CONSERVATION OF RIVER CORRIDORS, WATER BODIES, AND INFRASTRUCTURE:-
- Encroachment and diversion of water bodies and drainage channels must not be allowed.
- Pollution of the source of water and water bodies should not be allowed.
- Water bodies should be periodically inspected by a party punitive action should be taken against the person who is responsible for pollution.
- Legally empowered dam safety services need to be ensured in the state.

XVI. PROJECT PLANNING AND IMPLEMENTATION

- All clearance including environmental and investment clearance required for the implementation of the project.
- To avoid time and cost overruns, concurrent monitoring at a project, state, and central level should be undertaken for timely intervention.
- The project should be executed closely after they are planned.
- So that benefit starts immediately and there is no gap between potential created and utilized.
- Panchayat, municipalities, corporations, and WUA should be involved in the planning project.

➢ *Management of flood and drought:*
- Land, soil, energy, and water management with scientific input from local research and scientific institution should be used to evolve different agricultural strategies and improve soil and water productivity to manage drought.
- Flood forecasting is very important for flood preparedness and should be expanded across the country and modernized using real-time data acquisition systems and linked to forecasting for models.
- Revetment (wall) spurs and embankments should be constructed 30 the basis of morphological studies to prevent soil erosion.
- Operating procedures for reservoirs should be evolved and implemented to reduce the trapping of sediment during flood season.
- Frequency-based flood inundation maps should be prepared to evolve coping strategies.
- A community should be involved in preparing an action plan for dealing with floods and drought.

XVII. WATER SUPPLY AND SANITATION

- Efforts should be made to provide improved water supply in rural areas with proper sewerage facilities.
- The least water-intensive sanitation and sewerage system with decentralized sewage treatment plants should be incentivized.
- In urban and industrial area rainwater harvesting and desalinization should be encouraged to increase available utilizable water.
- Urban water supply and sewage treatment schemes should be integrated and executed.
- The water supply bill should include a sewerage charge.
- Subsidies and incentives should be implemented to encourage the recovery of industrial pollutants and recycling.

A. Institutional arrangements:
- A permanent water disputes tribunal should be established at the center to resolve disputes expeditiously.
- Communities should participate in the management of water resource projects and services.
- State govt. And local authorities can encourage the private sector to become a service provider through a public-private partnership.
- Integrated water resource management should be the main principle for the planning, development, and management of water resources.

B. Transboundary Rivers:
- An international agreement with neighboring countries for the exchange of hydrological data of international rivers on a real-time basis.
- River bank side states should be consulted during negotiations about sharing and management of water of international rivers keeping national interest in mind.

XVIII. DATA BASE AND INFORMATION SYSTEM

- A national Water informatics centers should be established to process hydrological data regularly from all over the country.
- All data should be put into the public domain.
- More data about snow and glacier, evaporation, tidal hydrology and hydraulics, river geometry changes, and erosion need to be collected.

A. Research and training needs:
- Grants should be given to states to update technology, design, practices, and planning and management.
- An autonomous center for research on water policy should be established to evaluate the impact of policy.
- To meet the demand for skilled manpower in the water sector regular training and academic course in water management should be promoted.
- A national campaign for water literacy needs to be started for capacity building of stakeholders in the water sector.

B. Implementation of national water policy:
- The national water board should prepare a plan of action based on the national water policy.
- State water policy needs to be revised under these policies.

C. Ministry of Jal Shakti
- A new 'Jal Shakti' Ministry, Ministry of Jal Shakti was formed by merging the Ministry of Drinking Water and Sanitation with the Ministry of Water Resources, River Water and Ganga Rejuvenation
- Minister - Gajendra Singh Shekhawat (Jodhpur)

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- MoS - Rattan LalKataria (Ambala)
- To supplement the efforts of the State Governments, Central Government provides technical and financial assistance to them through various schemes and programs.

D. The mandate of the Ministry

- International (Indus water dispute with Pakistan) and inter-State water disputes.
- Godavari Water Disputes Tribunal: Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh &Odisha
- Narmada Water Dispute - Rajasthan, Madhya Pradesh, Gujarat, and Maharashtra
- Ravi & Beas Water Tribunal - Punjab, Haryana, and Rajasthan
- Cauvery Water Dispute - Kerala, Karnataka, Tamil Nadu, and Puducherry.
- Mahadayi Water Disputes Tribunal - Goa, Karnataka, and Maharashtra.
- NamamiGange project, the flagship initiative to clean the Ganga and its tributaries.
- In the first Modi government, the project to clean the Ganga was moved from the Ministry of Environment to the Ministry of Water Resources
- Very high BOD level in a lot of stretches of Ganga Seen.
- Take forward" the program for linking rivers from different parts of the country, conceptualized under the AtalBihari Vajpayee government:-
- Ken - Betwa Link Project
- Damanganga - Pinjal Link Project
- Par - Tapi - Narmada Link Project
- Mahanadi - Godavari Link Project
- Manas-Sankosh-Teesta-Ganga link
- JalJeevan Mission (JJM) – HarGharJal which aims at providing potable water in adequate quantity of prescribed quality on a regular and long-term basis to every rural household, through tap water connection, by 2024 with an estimated outlay of Rs.3.60 lakh crore. The water sources which inter alia include groundwater, surface water (river, reservoir, lake, pond, springs, etc.), and rainwater stored in small tanks are being used as sources for drinking water supply schemes.
- The government of India launched Atal Mission for Rejuvenation & Urban Transformation (AMRUT) as a water-focused national urban mission in 2015 to achieve universal coverage of water supply in 500 Mission cities for five years which is extended till march 2023 for completion of projects.
- Atal Mission for Rejuvenation & Urban Transformation 2.0 (AMRUT 2.0) has been launched on 1st October 2021 to carry forward the objective of universal coverage of water supply from 500 cities to all statutory towns. AMRUT 2.0 focuses on making the cities 'self-reliant' and 'water secure'. Mission targets the provision of 2.68 crore tap connections to achieve the intended outcomes. The total indicative outlay for AMRUT 2.0 is ₹ 2,77,000 crore including a central share of ₹76,760 crores for five years from FY 2021-22 to FY 2025-26.
- AMRUT 2.0 aims to promote a circular economy of water through the development of a City Water Balance Plan for each city focusing on recycling/reuse of treated sewage, rejuvenation of water bodies, and water conservation.
- National Water Mission launched a campaign 'SahiFasal' campaign on 14.11.2019 to nudge farmers in water-stressed areas to grow crops that are not water intensive, but use water efficiently, and are economically remunerative. Under SahiFasal, a series of workshops have been organized in the water-stressed areas of the country, including four workshops in Amritsar (Punjab) on 14.11.2019, New Delhi on 26-27.11.2019, Aurangabad (Maharashtra) on 13.01.2020 and Kurukshetra (Haryana) on 14.02.2020.
- National Water Mission has launched another campaign "Catch the Rain" with the tagline "Catch the rain, where it falls, when it falls" to nudge the States and all stakeholders to create Rain Water Harvesting Structures (RWHS) suitable to the climatic conditions and sub-soil strata, with people's active participation, before the onset of monsoon to ensure storage of rainwater.
- The Ministry of Jal Shakti launched Jal Shakti Abhiyan-I (JSA-I), a campaign for water conservation and water security, in 256 water-stressed districts of the country. Under JSA-I, officers, groundwater experts, and scientists from the Government of India have worked with State and District officials in these water-stressed districts of the country to promote water conservation and water resource management by focusing on accelerated implementation of five target interventions, viz, water conservation & rainwater harvesting, renovation of traditional and other water bodies/tanks, reuse and recharge of bore wells, watershed development and intensive afforestation.
- The second "Jal Shakti Abhiyan, Catch The Rain" (JSA: CTR) campaign, was launched by the Hon'ble Prime Minister on 22 March 2021, with the theme – "Catch The Rain, Where it falls, When it falls". JSA: CTR is taken up in all districts (rural as well as urban areas) of the country during the pre-monsoon and monsoon period in the country i.e. from March 2021 to 30 November 2021.
- The government of India has launched the 3rd edition of the "Water Heroes-Share Your Stories" contest on 01.12.2021 for one year to promote the value of water in general and for supporting country-wide efforts on water conservation and sustainable development of water resources. This contest is aimed at sharing stories of people who are contributing towards water conservation.

E. Provision of clean drinking water

- The promise was made in the 2019 Election manifesto, to set up Jal Shakti, a new ministry for water resources and related issues
- Nal Se Jal
- NarendraModigovt's new focus The scheme 'Nal see Jal' to provide piped drinking water to every household by 2024
- Government's JalJivan Mission
- Challenges for the ministry - 2018 NITI Aayog report
- India is suffering from "the worst water crisis in its history

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- About 600 million people in the country face high to extreme water
- stress at present.
- 200,000 die every year because of inadequate access to safe water 75 % of Indian households didn't have access to drinking water on
- Premise.
- 84 percent of rural households didn't get piped water and 70 percent of the country's water was contaminated.
- Can the government double the farmers' income by 2022?
- Can the new ministry provide irrigation water facilities(Renewable energy challenges)
- 21 cities, including New Delhi, Bengaluru, Chennai, and Hyderabad, are set to run out of groundwater by 2020, affecting an estimated 100 million people (NITI Aayog report)
- India's water demand is likely to double by 2030 Water scarcity may account for a 6% loss in India's GDP by 2050. (World Bank)
- Master Plan for Artificial Recharge to Groundwater-2020 has been prepared by CGWB in consultation with States/UTs which is a macro-level plan indicating various structures for the different terrain conditions of the country
- Department of Water Resources, RD& GR has instituted National Water awards to incentivize good practices in water conservation and groundwater recharge.
- Mass awareness programs (Training, Seminars, Workshops, Exhibitions, Trade Fares Painting Competitions, etc.) are conducted from time to time each year under the information, Education & Communication (IEC) Scheme of DoWR, RD & GR in various parts of the Country to promote rainwater harvesting and artificial recharge to groundwater
- Central Government supports the construction of water harvesting and conservation works primarily through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and PradhanMantriKrishiSinchayeeYojana – Watershed Development Component (PMKSY-WDC).

F. NGOs working for water conservation in India

- Environmentalist Foundation of India
- Tarun Bharat Sangh
- SARA (Sustainable Alternatives for Rural Accord)
- Jal Bhagirathi Foundation
- Sehgal Foundation
- Dreams Alive
- Centre for Aquatic Livelihood Jaljeevika
- Watershed Organisation Trust (WOTR)
- Self-Reliant Initiatives through Joint Action (SRIJAN)
- Sankalpa Rural Development Society

XIX. CONCLUSION

- Because of the vital importance of water for human and animal life, for maintaining ecological balance, and for economic and developmental activities of all kinds, and considering its increasing scarcity, the planning and management of this resource and its optimal, economical, and equitable use has become a matter of the utmost urgency. Concerns of the community need to be taken into account for water resources development and management. The success of the National Water Policy will depend entirely on evolving and maintaining a national consensus and commitment to its underlying principles and objectives. To achieve the desired objectives, State Water Policy backed with an operational action plan shall be formulated in a time-bound manner say in two years. National Water Policy may be revised periodically as and when the need arises.
- Drinking water is a very important thing to our bodies health. Not only humans but also all organisms need water to survive. The importance of drinking water for our bodies is paramount to our health because it makes up to 70 percent of our bodies' weight

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