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Mission Document

National Water Mission

Under

National Action Plan on Climate Change

D/o Water Resources, RD & GR,

Ministry of Jal Shakti, Govt. of India,

New Delhi, 2021

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Annexures

Executive Summary

The main objective of the National Water Mission is "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management". The five identified goals of the Mission are: (a) comprehensive water data base in public domain (b) assessment of impact of climate change on water resource; (c) promotion of citizen and state action for water conservation, augmentation and preservation and focused attention to vulnerable areas including over-exploited areas; (d) increasing water use efficiency by 20%, and (e) promotion of basin level integrated water resources management.

Various strategies for achieving the goals have been identified which lead to integrated planning for sustainable development and efficient management with active participation of the stakeholders after identifying and evaluating the development scenario and management practices towards better acceptability on the basis of assessment of the impacts of climate change on water resources based on reliable data and information. In this context, the latest contribution (2021) of the Working Group I of the Intergovernmental Panel for Climate Change (IPCC) to the Sixth Assessment Report of IPCC, indicating that continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events has been taken note of.

Relatively very large temporal and spatial variation in rainfall and consequently in the river flow and ground water aquifers is an important feature of the water resources in India. Although the impact of climate change on water resources has not been accurately quantified, various studies indicate that the likely impact of climate change on water resources could contribute to further intensification of the extreme events. Further, the features of water resources – both the availability and the quality may also be considerably affected by the changes in the land use in the form of urbanization, industrialization and changes in the forest cover. Realizing that the various processes which influence the hydrologic cycle are of dynamic nature, precise quantification of the impact specifically due to climate change may not be a simple task and it would be necessary to make suitable assumption at the initial stages and undertake detailed simulation studies with more and more data as they become available with time. However, the likely impact of climate change on water resources could be in the form of:

- Decline in the glaciers and the snowfields in the Himalayas;
- Increased drought like situations due to overall decrease in the number of rainy days in many parts of the country;
- Increased flood events due to overall increase in the rainy-day intensity;
- Effect on groundwater quality in alluvial aquifers due to increased flood and drought events;
- Influence on groundwater recharge due to changes in precipitation and evapo-transpiration; and

- Increased saline intrusion of coastal and island aquifers due to rising sea levels.

From the above, it is apparent that in the context of likely impact of climate change on water resources, the most vulnerable areas in India would include (a) drought prone areas, (b) flood prone areas, (c) the coastal regions, (d) the region with deficient rainfall, (e) areas with over-exploited, critical and semi-critical stage of ground water development, (f) water quality affected areas, and (g) snow-fed river basins.

For achieving the objectives of the National Water Mission, long-term sustained efforts both in terms of time bound completion of identified activities and ensuring the implementation of identified policies and enactment of necessary legislation through persuasion at different levels with the State Governments have been envisaged. Some of the important activities which are planned to be completed in a time bound manner on priority are as under:

A. Comprehensive water data base in public domain

- Dissemination of necessary reliable data on water.
- Interaction with data users as well as get feedback from them on data usability and requirement of additional data.
- Regular publication of the Composite Water Management Index (CWMI) developed by NITI Aayog to provide useful information to State Governments and Central Government to formulate and implement suitable strategies for improved management of water resources.

B. Assessment of the impact of climate change on water resources

- Research and studies on all aspects related to impact of climate change on water resources including water storage, flooding, drought, water quality and public health with active collaboration of all research organizations working in the area of climate change as per the guidelines mandated by inter-governmental panel of climate change (IPCC), NDCs and SDGs.

C. Promotion of citizen and state actions for water conservation, augmentation and preservation; and focused attention to vulnerable areas including over-exploited areas

- Capacity building of relevant stakeholders, viz. urban local bodies, Panchayati Raj Institutions, water user associations, etc. involved in the management of water resources, with special attention to vulnerable and over-exploited areas.
- To promote Participatory Irrigation Management (PIM), with active participation of CADA and irrigation departments of State Governments.
- To promote rain water conservation and recharge structures, and encourage States to establish District Rain Water Harvesting Cell or Jal Shakti Kendra for technical support.

D. Increasing water use efficiency by 20%

- Research in area of increasing water use efficiency and maintaining its quality in agriculture, industry and domestic sector.
- Undertake pilot projects for improvement in water use efficiency in collaboration with States.
- Promotion of "Sahi – Fasal" campaign to nudge the farmers needs and to provide incentivized and suitable market environment for the crops using less water and having good productivity.
- Undertake pilot projects for implementing Sahi-Fasal concept of water use efficiency in agriculture sector with the help of NGOs and district level & State level authorities.
- To promote incentivizing through award for water conservation & efficient use of water; and
- Taking up a case for setting up of a National Bureau of Water Use Efficiency (NBWUE)

E. Promotion of basin level integrated water resources management

- Promotion of principles of IWRM in the planning and development of water resources, with special attention to convergence among various resources and programs.

Chapter 1: Introduction

India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change. This threat emanates from accumulated greenhouse gas emissions in the atmosphere, anthropogenically generated through long term and intensive industrial growth and high consumption lifestyles in developed countries. While engaged with the international community to collectively and cooperatively deal with this threat, India needs a national strategy to firstly, adapt to climate change and secondly, to further enhance the ecological sustainability of India's development path.

Climate change may alter the distribution and quality of India's natural resources and adversely affect the livelihood of its people. With an economy closely tied to its natural resource base and climate-sensitive sectors such as agriculture, water and forestry, India may face a major threat because of the projected changes in climate.

The global warming may affect the hydrological cycle which could result in further intensification of temporal and spatial variations in precipitation, snow melt and water availability. The report on "India's Initial National Communication to the United Nations Framework Convention on Climate Change" published by Ministry of Environment and Forests, Government of India in the year 2004 identifies the following projected impacts of climate change on water resources.

"It is obvious that the projected climate change resulting in warming, sea level rise and melting of glaciers will adversely affect the water balance in different parts of India and quality of ground water along the coastal plains. Climate change is likely to affect ground water due to changes in precipitation and evapo-transpiration. Rising sea levels may lead to increased saline intrusion into coastal and island aquifers, while increased frequency and severity of floods may affect groundwater quality in alluvial aquifers. Increased rainfall intensity may lead to higher runoff and possibly reduced recharge."

Some of the possible identified implications of climate change on water resources are listed below:

- Decline in the glaciers and the snowfields in the Himalayas;
- Increased drought like situations due to overall decrease in the number of rainy days over a major part of the country;
- Increased flood events due to overall increase in the rainy day intensity;
- Effect on groundwater quality in alluvial aquifers due to increased flood and drought events;
- Influence on groundwater recharge due to changes in precipitation and evapo-transpiration; and
- Increased saline intrusion of coastal and island aquifers due to rising sea levels.

With a view to address the related issues, the National Action Plan on Climate Change (NAPCC) has been prepared by the Government of India, which was released by the Hon'ble Prime Minister on 30th June 2008.

The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of impact of climate change through eight National Missions namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a Green India, (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

The Mission Document of "National Water Mission" identifies the strategies for achieving the goals of (a) Comprehensive water data base in public domain (b) assessment of the impact of climate change on water resource, (c) Promotion of citizen and state actions for water conservation, augmentation and preservation, and Focused attention to vulnerable areas including over-exploited areas, (d) Increasing water use efficiency by 20%, and (e) Promotion of basin level integrated water resources management.

Chapter 2: Objectives of Mission Document

The National Action Plan on Climate Change (NAPCC) describes the features of National Water Mission as under:

> *"A National Water Mission will be mounted to ensure integrated water resource management helping to conserve water, minimize wastage and ensure more equitable distribution both across and within states. The Mission will take into account the provisions of the National Water Policy and develop a framework to optimize water use by increasing water use efficiency by 20% through regulatory mechanisms with differential entitlements and pricing. It will seek to ensure that a considerable share of the water needs of urban areas are met through recycling of waste water, and ensuring that the water requirements of coastal cities with inadequate alternative sources of water are met through adoption of new and appropriate technologies such as low temperature desalination technologies that allow for the use of ocean water.*
>
> *The National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. This will include enhanced storage both above and below ground, rainwater harvesting, coupled with equitable and efficient management structures.*
>
> *The Mission will seek to develop new regulatory structures, combined with appropriate entitlements and pricing. It will seek to optimize the efficiency of existing irrigation systems, including rehabilitation of systems that have been run down and also expand irrigation, where feasible, with a special effort to increase storage capacity. Incentive structures will be designed to promote water-neutral or water-positive technologies, recharging of underground water sources and adoption of large scale irrigation programmes which rely on sprinklers, drip irrigation and ridge and furrow irrigation."*

The NAPCC also describes the procedure for implementation of the Mission as:

> *"These National Missions will be institutionalized by respective ministries and will be organized through inter-sectoral groups which include in addition to related Ministries, Ministry of Finance and the Planning Commission, experts from industry, academia and civil society. The institutional structure would vary depending on the task to be addressed by the Mission and will include providing the opportunity to compete on the best management model.*
>
> *Each Mission will be tasked to evolve specific objectives spanning the remaining years of the 11th Plan and the 12th Plan period 2012-2013 to 2016-2017. Where the resource requirements of the Mission call for an enhancement of the allocation*

in the 11th Plan, this will be suitably considered, keeping in mind the overall resources position and the scope for re-prioritization.

Comprehensive Mission documents detailing objectives, strategies, plan of action, timelines and monitoring and evaluation criteria would be developed and submitted to the Prime Minister's Council on Climate Change by December 2008. The Council will also periodically review the progress of these Missions. Each Mission will report publicly on its annual performance.

Building public awareness will be vital in supporting implementation of the NAPCC. This will be achieved through national portals, media engagement, civil society involvement, curricula reform and recognition / awards, details of which will be worked out by an empowered group. The Group will also consider methods of capacity building to support the goals of the National Missions.

We will develop appropriate technologies to measure progress in actions being taken in terms of avoided emissions, wherever applicable, with reference to business as usual scenarios. Appropriate indicators will be evolved for assessing adaptation benefits of the actions.

These Eight National Missions taken together, with enhancements in current and ongoing programmes included in the Technical Document, would not only assist the country to adapt to climate change, but also, importantly, launch the economy on a path that would progressively and substantially result in mitigation through avoided emissions."

The 'Technical Document' annexed with the NAPCC has identified key areas related to (a) studies on management of surface water resources, (b) management and regulation of ground water resources, (c) upgrading storage structures for fresh and drainage system for wastewater, (d) conservation of wetland, and (e) development of desalination technologies etc. required to be considered while preparing the comprehensive document for the National Water Mission.

As following chapter puts forth the goals and strategies of this mission, due care has been taken in incorporating the emerging trends and challenges in the water sector, and an attempt has been made while drafting the goals and strategies that they remain complementary to each other and are integrated around a shared purpose of **promoting water security for all**.

Chapter 3: Goals and Strategies

Over the last few decades, pressure on water resources has been increasing significantly, owing to unprecedented changes in the patterns of consumption and distribution of these vital resources across space and time. A need was felt to accelerate adoption of interdisciplinary and innovative approach to tackle the problems related to water resources and their management. The strategies that were earlier defined had their root in a wider consultative process, whereupon the erstwhile Ministry of Water Resources (MoWR) constituted six Sub-Committees to meticulously examine all related aspects in the fields of:

a. Policy and Institutional Framework;
b. Surface Water Management;
c. Groundwater Management;
d. Domestic and Industrial Water Management;
e. Efficient Use of Water for Various Purposes; and
f. Basin Level Planning and Management.

The goals and corresponding strategies that ensued this process has been the principal guiding force behind every single actions of this mission, since its operationalization under the then MoWR (now Ministry of Jal Shakti). Now, keeping in tune with the emerging trends in the sector, these goals and strategies are further modified to ensure this mission is abreast and equipped to steer country's water agendas forward in innovative ways. Accordingly, the following goals and strategies have been proposed:

1. Comprehensive water data base in public domain;
2. Assessment of impact of climate change on water resources;
3. Promotion of citizen and state actions for water conservation, augmentation and preservation, and focused attention to vulnerable areas including over-exploited areas;
4. Increasing Water Use Efficiency by 20%; and
5. Promotion of basin level integrated water resources management.

Goal 1: Comprehensive water data base in public domain

Water related data is being collected by various Central and State agencies for different purposes and kept in as many formats. The networks for data collection for various hydrological and other related parameters require a review for their adequacy to meet the requirement for reliable assessment of the impact of climate change on water resources. The collected data is required to be put in public domain so that policy makers and academician can access that with ease for their respective uses and people at large can form their well-informed views/opinions on various related matters.

The first and the foremost action required is to have a comprehensive data base in public domain (except for the data of sensitive nature), which inter-alia includes collection and publication of necessary data.

The strategies identified for achieving the goal include: (a) Dissemination of necessary reliable data on water; and (b) Interaction with data users as well as getting feedback from them on data and requirement of additional data.

Constitution of the Inter-Sectoral Advisory Group for Goal 1 is displayed at Annexure – C. Chairman, Central Water Commission would head the group. The Committee would also include Secretary, Earth Sciences besides various representatives of other ministries /departments.

All data and entire information (except data of sensitive and classified nature) would be placed in the public domain by respective agencies. First set of data has since been put in public domain with launching of first phase of "Water Resources Information System" on 7th December 2010.

The identified strategies to achieve the objectives of Goal 1 are summarized as under:

S.N.	***Strategies***	***Action Points***
1.1	**Dissemination of necessary reliable data on water.**	a. NWM to act as one of the information dissemination centers/ agency.
		b. Development of a data sharing portal by linking the websites of different organizations dealing with data on water such as the National Water Informatics Center.
		c. Review of network of hydrological observation stations, automatic weather stations and automated rain gauge stations to assess the adequacy from time to time.
		d. Listing of organizations working in particular field such as Groundwater, Surface water,

		Climate Change, Environmental, Forest etc. and request them about for their datasets. e. Regular publication of the Composite Water Management Index (CWMI) developed by NITI Aayog to provide useful information to State Governments and Central Government to formulate and implement suitable strategies for improved management of water resources.
1.2	**Interaction with data users as well as get feedback from them on data usability and requirement of additional data.**	a. Interaction with data users and getting feedback from them for improvement in collection and processing of data. b. Ensuring data transparency except for sensitive and classified nature, all data would be in public domain and easily available to public to facilitate and promote citizen action in water conservation, augmentation and preservation. c. Gathering the most needful datasets from each organisation and highlighting that dataset which may need in future. Data validation through robust research by including educational institutes and other research organization dealing with water resources and climate change studies.

Goal 2: assessment of the impact of climate change on water resources

The strategies identified for achieving the goal include: (a) Research and studies on all aspects related to impact of climate change on water resources including quality aspects of water resources including water storage, flooding, drought, water quality and public health with active collaboration of all research organizations working in the area of climate change as per the guidelines mandated by IPCC, NDCs and SDGs; (b) Projection of the impact of climate change on water resources as per the guidelines mandated by IPCC; and (c) Assessment of the Impact of Climate Change on water governance.

The initial projections of the impact of climate change on water resources including the likely changes in the water availability in time and space shall be targeted by the year 2022.

Constitution of the Inter-Sectoral Advisory Group for Goal 2 is displayed at Annexure – D.

The identified strategies to achieve the objectives of Goal 2 are summarized as under:

S.N.	*Strategies*	*Action Points*
2.1	**Research and studies on all aspects related to impact of climate change on water resources including quality aspects of water resources including water storage, flooding, drought, water quality with active collaboration of all research organizations working in the area of climate change as per the guidelines mandated by Inter-governmental Panel on Climate Change (IPCC), NDCs and SDGs.**	a. Research and studies on all aspects related to impact of climate change on water resources including water storage, monsoons, flooding, drought, water quality with active collaboration of all research organizations working in the area of climate change: (i) As per the guidelines mandated by Inter-Governmental Panel of Climate Change (IPCC), NDCs and SDGs. (ii) Involving researchers, professionals, private firms for larger climate change analysis. (iii) In the projects/studies facilitated by NWM, for real time forecast models/climate change models, contributions may be taken from other government organisations (such as ISRO, MoES, etc.) (iv) Studies could include research related to 'Crop Water Requirement' b. Development of district level water resource inventories including the information of reservoirs (small and large), streams, dams, canals, rivers, water used for various purposes. c. Research and study of State level/basin level water-energy-climate change relationships including both urban and rural area. d. Finding datasets about impact of climate change on water resources collected by various organizations working in the respective fields. Dissemination of data to users on climate change. e. **Making available all research and development based studies funded by NWM,**

		available in the public domain, as and when completed"
2.2	**Projection of the impact of climate change on water resources as per the guidelines mandated by IPCC, NDCs and SDGs.**	a. Yearly projection of water resources sector wise availability as a result of impact of climate change which would inter-alia include the likely changes in the characteristics of water availability in time and space with focus on areas vulnerable to climate change.
		b. Projection of the impact of climate change on water resources as per the guidelines mandated by IPCC, NDCs and SDGs.
2.3	**Improvement in water governance for mitigation of impact of climate change on water resources**	a. Impact of climate change on water governance and gender equity need to be analyzed based on water demand and supply change due to uncertain droughts and floods.

Goal 3: Promotion of citizen and state actions for water conservation, augmentation and preservation, and Focused attention to vulnerable areas including over-exploited areas

Promotion of Citizen and State Action for Water Conservation:

The studies concerning the impact of climate change on water resources indicate that various components of the hydrological cycle would be affected, resulting in further intensification of temporal and spatial vitiations of the water availability. This situation calls for urgent steps towards conservation of the available water resources. It is also necessary to take immediate steps for the augmentation of the utilizable water resources. Water, the most precious gift of nature can be of beneficial use to the mankind only if all the stakeholders are fully involved in its development and management. It has already been established that the participatory approach in water management has yielded excellent results. There are many success stories including Hiware Bazar Panchayat, District Ahmednagar, Maharashtra, Village-Jakhni, Distt. Banda, Uttar Pradesh and Vruksha Prem Seva Trust, Upleta, District Rajkot, Gujarat etc. Mass awareness and

capacity building of the stakeholders are also very important strategies for water conservation, augmentation and preservation.

The "promotion of citizen and state action for water conservation, augmentation and preservation" is an important goal of the Mission. The strategies identified include (a) Capacity building to empower and involve of Panchayati Raj Institutions, urban local bodies, Water User's Associations and primary stakeholders in the management of water resources with a focus on water conservation, augmentation and preservation; (b) Promote participatory irrigation management (PIM) with active involvement with CADA (Command Area Development Authority) and State Irrigation Departments; (c) Sensitization of elected representatives and stakeholders of over-exploited areas and water resources vulnerable areas, viz. flood prone zone, wetlands and springs on dimensions of the problems and to orient investment under MNREGA towards water conservation; (d) Promote and provide incentives for water neutral and water positive technologies in industry; (e) Promote and encourage participation of NGOs in various activities related to water resource management, particularly in planning, capacity building and mass awareness; and (f) To promote and encourage involvement of corporate sectors / industries to take up, support and promote water conservation, augmentation and preservation within the industry and as a part of their corporate social responsibility; (g) Promotion of water conservation by rain water harvesting & artificial recharge structures; (h) Encouraging States to establish a " district rain water harvesting & artificial recharge structure cell" at their district headquarters for technical support and guidance; (i) Promotion of social communication, social media and digital media for water conservation..

Constitution of the Inter-Sectoral Advisory Group for Goal 3 is displayed at Annexure – E. Nodal responsibility for water conservation, augmentation and preservation would be with National Water Mission, Ministry of Water Resources and at the State level, the nodal responsibility would vest with the Development Commissioners or Principal Secretary of Rural Development Department of the State as the basic action would be through MGNREGA. The State level body would be convened by the Secretary, Water Resources of the State Government.

Nodal responsibility for promoting PIM (Participatory Irrigation Management) in States should be given to their Water Resource Department. An action plan for each State would also be developed and put into implementation. Do-it-yourself methods would be promoted for citizen action with NGO involvement.

Sensitization of all panchayat members and their functionaries in dark and grey blocks will be completed by 2021-2022.

Focused attention to vulnerable areas:

There is urgent need for appropriate measures in the vulnerable areas which are likely to be adversely affected due to impact of climate change and the areas where the water resources, particularly the groundwater resources –which are declining due to overuse. In about 15% of the assessment blocks, groundwater has been over-exploited and about 14% of the blocks are in critical or semi-critical state.

The strategies identified for the goal "focused attention to vulnerable areas including over-exploited areas" include (a) Promotion of traditional system of water conservation; (b) Promotion of physical sustainability of groundwater resources; (c) Promotion of intensive programme for ground water recharge in over-exploited, critical and semi-critical areas; and (g) Promotion of assessment of water purification and desalination. It is observed that the active participation of the stakeholders has yielded very encouraging results in water management. The "Andhra Pradesh Farmer-Managed Ground Water systems" is one among such success stories. Therefore, it is recommended that any strategy to promote water security in areas identified as vulnerable should be implemented in ways that promote multi-disciplinary and cross sectoral partnerships across various users of water resources.

Institutional arrangement at national level for steering the activities as planned under this goal has to source expertise from across the disciplines of urban planning, ecological economics, sustainable entrepreneurship, hydrology, political geography, etc. Hence it is recommended that, apart from concerned members from the ministries, experts should be pooled from academia, industry associations, and civil society groups active in bridging the building inequity in terms of resource production and consumption patterns in India. To sensitize strategies from the gender perspective, the committee should have representative of experts working in the field of feminist political science and other experts from the field of development studies. The nodal authority shall remain with Ministry of Jal Shakti owing to the need for mobilizing interdisciplinary spirit of actions, and capture diversity of challenges as stipulated in this goal, with members drawn from the Ministries of social development, Rural Development, Agriculture, and Corporate Affairs. Notable educational institutions and industry players shall also be roped into the pool of members to ensure that the integrated and multidisciplinary spirit of strategies as identified in this goal is nurtured and sustained throughout the implementation phase. Constitution of the Inter-Sectoral Advisory Group for Goal 3 is displayed at Annexure – E.

The identified strategies to achieve the objectives of Goal 3 are summarized as under:

S. N.	*Strategies*	*Action Points*
3.1	**Capacity building to empower and involve Panchayati Raj Institutions, urban local bodies, Water User's Associations (WUA) and other stake holders in the management of water resources with focus on water conservation, augmentation and preservation;**	a. Capacity building & sensitization of all Panchayati Raj members and their functionaries, urban local bodies, Water User's Associations (WUA) in water vulnerable & water stressed areas. b. Capacity building of organizations associated with water resources development and management. c. Promotion of do-it-yourself action by citizens through intensive social communication with active involvement of NGOs.
3.2	**To promote & encourage participatory irrigation management; PIM) with active involvement and support of CADA (Command Area Development Authority) & State Irrigation departments.**	a. Encourage participatory irrigation management through "Command Area Development and Water Management Programme" with active involvement and support of CADA (Command Area Development Authority) & State Irrigation departments. b. Encourage States to enact appropriate Participatory Irrigation Management (PIM) Act.
3.3	**Sensitization of elected representatives and stakeholders of over-exploited areas & water resource vulnerable areas viz. flood prone zone, Wetland zones, & Springs on dimensions of the Water resource & scarcity problems and to orient investment under MNREGA towards water conservation;**	a. Sensitization & capacity building of elected representatives of over-exploited areas & water resource vulnerable areas viz. flood prone zone, wetland zones, & springs on dimensions of the water resource & scarcity problems and to orient investment under MNREGA towards water conservation by 2020-2022.
3.4	**To promote & Provide incentives for water neutral**	a. To organize training & capacity building programs for the industries & corporate sector to aware them about

	and water positive technologies in industry ;	water positive & water neutral technologies.
		b. To promote & provide incentives for water neutral and water positive technologies including attractive fiscal package.
		c. To promote & provide incentives for water neutral and water positive technologies in industry.
		d. Encourage and incentivize the reuse of treated effluents.
3.5	**To promote, incentivize & encourage participation of NGOs in various activities related to water resources management, particularly in planning, capacity building and mass awareness;**	a. To promote, incentivize & encourage participation of NGOs in various activities related to water resources management, particularly in planning, capacity.
3.6	**To promote & encourage the involvement of corporate sector / industries to take up, support and promote water conservation, augmentation and preservation within the industry and as a part of their corporate social responsibility.**	a. To organize training & capacity building programs for the industries & corporate sector to aware them about activities which can be acquired under CSR for water conservation, preservation & augmentation.
3.7	**Promotion of water conservation by Rain water harvesting & artificial recharge structures.**	a. Awareness drives to make check dams, water harvesting pits, rooftops RWHS.
		b. To initiate a "**Catch the Rain**" campaign in different schools, colleges, universities, offices, institutes etc. of the district to make them aware and build their capacity about the importance of Rain Water

		Harvesting for water conservation, preservation and augmentation.
		c. Expeditious implementation of programme for construction, repair, renovation and restoration of water bodies in areas / situations sensitive to climate change by (i) increasing capacity of minor tanks, and (ii) rehabilitating water bodies, with changed focus.
		d. To promote the use of defunct bore-wells as rain water recharge structures. e. To accelerate adoption of water conservation measures outlined above through annual Jal Shakti Abhiyaans.
3.8	**To encourage states to establish a "district rain water harvesting & artificial recharge structure cell" at their district headquarters for technical support and guidance.**	a. To encourage States to establish a "district rain water harvesting & artificial recharge structure cell" or "Jal Shakti Kendra" at their district headquarters for technical support and guidance.
3.9	**Promotion of social Communication, social media & digital media for water conservation.**	a. Promotion of social communication, social media & digital media for water conservation.
3.10	**Promotion of traditional system of water conservation**	a. Promote expeditious implementation of programme for repair, renovation and restoration of water bodies such as Dug Well, Step Wells (Baulis), Ponds, Lakes, etc. in areas / situations vulnerable to water stress by promoting knowledge base and awareness .

3.11	**Promotion of physical sustainability of ground water resources**	a. Promote active community participation in ground water recharging including water harvesting with special emphasis on over overexploited, critical and semi-critical areas, and promote their monitoring, regulation & management.
		b. Promotion of a panchayat / district level model for ground water regulation.
		c. Promote and provide incentive for adopting and sustaining rain water harvesting systems including roof top rain water harvesting system.
3.12	**Promote an intensive programme for ground water recharge in over-exploited, critical and semi-critical areas**	a. Promote ground water recharging including rainwater harvesting with special emphasis in over exploited, critical and semi critical areas. Encouraging expansion of programme for recharge of ground water through dug well.
		b. Promoting expeditious implementation of programme for conservation of water through recharge of ground water including rainwater harvesting in over-exploited, critical and semi-critical areas including (i) facilitating preparation of State-wise implementation plan for rain water harvesting and artificial recharge based on master plan of CGWB both for rural and urban areas and monitoring mechanism, (ii) Implementation of rain water harvesting and artificial recharge with special attention to over exploited assessment units, critical and semi-critical areas and their impact assessment, and (iii) Identify and promote incentives for adopting and

		sustaining roof top rain water harvesting systems.
3.13	**Innovation and cost effective water purification technologies**	**a.** Promote assessing and study of quality of water. b. Promote, research for development of cost effective water purification technologies.
3.14	**Setting up of Water Knowledge Centers/Jal Shakti Kendras**	c. Setting up of such centers at appropriate levels for the developing suitable water conservation structure based on the climatic conditions and the sub-soil strata
		.

Goals 4: Increasing water use efficiency by 20%

Achieving high water use efficiency is thus the first step along the path towards sustainable water development and management. The National Water Policy, 2012 also lays stress on conservation of water. One way to ensure rapid sustainable development is to attempt highest standards of efficiency in water use besides demand side optimal management through mass awareness.

One of the most important goals of the National Water Mission is to improve the efficiency of water use at least by 20%. The objective can be achieved by ensuring improved efficiency both on the demand side as well as the supply side. Research in the area of increasing the water use efficiency in agriculture, industry and domestic water is very important strategy. Similarly, full utilization of the created facilities and better design and proper operation and maintenance would considerably help in improving the efficiency on supply side. Use of micro irrigation, promotion of water neutral and water positive technologies, recycling of water, proper cropping patterns, etc. are also very important measures for increasing the efficiency. At the same time adoption of better management practices are also very important.

An analysis shows that modernization and renovation of existing old projects, command area development including selective lining of water courses etc. may increase the overall irrigation efficiency by about 20-21%. About 5,000 field demonstrations, all over the country, of the technological interventions suited to the local conditions by academicians and research organizations have shown increase in yields as well as water savings.

The strategies included under the goal "Increasing water use efficiency by 20%" are

1. Research in area of increasing water use efficiency and maintaining its quality in agriculture, industry and domestic sector;
2. To promote the recycling of water including wastewater, and water efficient techniques and technologies;
3. To promote efficiency of urban water supply system;
4. Promotion of efficiency labeling of water appliances, sanitary fittings and fixtures in collaboration with BIS;
5. Undertake pilot projects for improvement in water use efficiency in collaboration with States;
6. Promote Water Resources Regulatory Authorities for equitable distribution and nominal charges for water facilities;
7. Setting up National Bureau of Water Use Efficiency;
8. Promote use of efficient irrigation practices and fully utilize the created facilities through participatory campaigns, like awareness on increasing in WUE in agriculture such as "Sahi Fasal" that aimed to nudge farmers to grow less water intensive crops and to increase awareness about suitable environment and markets for these crops;
9. Undertake pilot projects for implementing Sahi-Fasal concept with the help of NGOs and district level & State level authorities; and
10. Promote incentivizing through award for water conservation & efficient use of water.

The gap between irrigation potential created, through major and minor projects, and the actual usage is increasing and affecting the country's agricultural productivity, according to the Indian Council of Agriculture Research (ICAR). India receives annual precipitation (including snowfall) of almost 4,000 billion cubic meter (BCM), which results into estimated average water potential of 1,869 BCM. But its per capita availability is reducing year on year. The per capita annual water availability has declined from 5,177 cubic meters (cm) in 1951 to 1,508 cm by 2014, and is likely to reduce further to 1,465 cm and 1,235 cm by 2025 and 2050, respectively. This reducing availability of water compounded by climate change underline the imperative to increase water use efficiency. To reduce the consumption of water and maximize agricultural productivity in the country, NWM is trying to introduce different innovations. NWM has also came up with the Sahi-Fasal campaign in order to promote less water intensive crops and to create mass awareness about the benefits of crop diversification and cropping patterns. At present, there is a gap of about 15% in the irrigation potential created and utilized. Full utilization of the created facilities has been identified as an important strategy.

Constitution of the Inter-Sectoral Advisory Group for Goal 4 is displayed at Annexure – F. Nodal responsibility would be of Secretary of Ministry of Water Resources and would have Ministry of Agriculture, Urban Development, Power and Rural Development (Department of Drinking Water & Sanitation) as members. At State level the Committee would be chaired by the Secretary, Water Resources of the State Government with similar composition.

The timeline for action would be to increase water use efficiency by 20% by the year 2025. The gap of about 15% between the irrigation potential created and the irrigation potential utilized would also be reduced by half by the year 2025.

The strategies identified to address the issues related to Goal 4 are summarized in the following table.

S. N.	***Strategy***	***Identified Action Points***
4.1	**Research in area of increasing water use efficiency and maintaining its quality in agriculture, industry and domestic sector;**	a. To develop water efficiency guidelines for agriculture and industry sector based on the recommendations received from baseline studies and benchmarking studies. b. To open a research cell to develop new yet actionable methodologies to increase WUE in all sectors. c. To collaborate with academia/universities and institutes to provide research and innovation in water use efficiency. d. Research in the field of crop market in order to link crop production and variety with respect to the water availability, region wise. e. Demand side water management in all three sectors putting more emphasis on agricultural and industrial sectors.
4.2	**To promote the recycling of water including wastewater, and water efficient techniques and technologies**	a. Incentivize recycling of wastewater, and using eco-friendly methods for recycling whenever possible **as well as promotion of use of treated wastewater for secondary purposes**. b. To work closely with Ministry of Housing & Urban Affairs and CPCB .

		c. Incorporate component of incentivizing recycling of wastewater in agriculture in the Sahi-Fasal campaign. d. To provide appropriate space for **compilation and publication of modern water-efficient techniques and technologies as well as** recycling **methods**, and to show case **them** in various events organized by NWM including in the 'Water-Talk'. e. Stakeholder consultation with various industry groups/NGOs/research firms and to prepare a basket of sector-wise water efficient techniques for further guiding States.
4. 3	**To promote efficiency of urban water supply system**	a. To initiate benchmarking studies for urban water use and introduce concept of water efficiency index for urban areas. b. To work closely with Ministry of Housing and Urban Affairs and to promote guidelines for water conservation prepared by them.
4.4	**Promotion of efficiency labeling of water appliances, sanitary fittings and fixtures in collaboration with BIS.**	a. To work closely with BIS to promote efficiency labelling of water appliance and sanitary fittings. b. To promote the reduction of non-revenue water by encouraging 100% metering. c. To provide appropriate space to show case new and innovative technologies on recycling of water in various events organized by NWM including Water-Talk.

4.5	**Undertake pilot projects for improvement in water use efficiency in collaboration with States;**	a. Call for project proposals from States **and promote implementation of advanced technologies and IWRM approaches in field technologies and in decision-making**
4.6	**Promote Water Regulatory Authorities for equitable distribution and nominal charges for water facilities;**	a. To study water regulatory authorities and to develop guidelines to establish WRA in each State.
4.7	**Setting up of a National Bureau of Water Use Efficiency (NBWUE)**	a. Taking up a case for setting up of a National Bureau of Water Use Efficiency (NBWUE) **which will compile and publish best practices in the field of water conservation at the national level**" b. Issuing of certificates for water-use efficiency as a tool for raising awareness and incentivising best practices
4.8	**To promote use of efficient irrigation practices and fully utilize the created facilities through participatory campaigns, like awareness on increasing in WUE in agriculture such as**	a. To conduct **Sahi-Fasal workshop** in every water stressed region as done in 2019. b. To promote incentivized and suitable market environment for the crops using less water and having good productivity. c. To encourage farmers, organizations and district who are following efficient

	"Sahi Fasal" that aimed to nudge farmers to grow less water intensive crops and to increase awareness about suitable environment and markets for these crops.	irrigation practices during different campaigns or events at State level while working closely with CWC.
4.9	**Undertake pilot projects for demonstrating the Sahi-Fasal concept with the help of NGOs, district and state level authorities**	a. Call for proposals in order to implement the Sahi-Fasal campaign and to see the impact on change in cropping pattern with respect to the water availability at district level. b. Assess action taken by different States/ organization and popularizing the findings as good practices.
4. 10	**To promote incentivizing through awards for water conservation & efficient use of water**	a. To promote incentivizing through award for efficient use of water in all three sectors & efficient irrigation practices.

Goal 5: Promotion of basin level integrated water resources management

Promotion of basin level integrated water resources management is a very important goal identified for the National Water Mission (NWM). Various strategies identified under the goal are:

(i) Planning on the principle of integrated water resources development and management;

(ii) Ensuring convergence among various water resources programs.

Constitution of the Inter-Sectoral Advisory Group for Goal 5 is displayed at Annexure – G. Strategies and corresponding action points for Goal 5 are presented below:

S. No.	***Strategy***	***Key Action Points***
5.1	**Planning on the principle of integrated water**	a. Preparation of appropriate guidelines b. Interaction with States

	resources development and management	c. Adoption and application of guidelines by project authorities and appraising agencies *State Specific Action Plan (SSAP) have been adopted to help facilitate all these action plans*
5.2	**Ensuring convergence among various water resources programmes**	a. Expeditious formulation of the projects for utilization of surplus flood water for beneficial use of the society and implementation of projects after evaluating costs and land acquisition problems *State Specific Action Plan (SSAP) has been adopted to help facilitate all these action plans*

Chapter 4: Institutional Setup and Plan of Action

The institutional setup of NWM may be reconsidered to allow for functioning in the mission mode, which may help expedite completion of the targets set by the organization.

Proposed Set-up:

1. **DG and Mission Director**: Overall in charge and head of the Mission.
   He will be assisted by ADG (Admin, Finance and Planning) and ADG (NWM).
2. **ADG (Admin, Finance and Planning):** Responsible for overall administrations of NWM including budgeting and all financial matters of NWM. He should be responsible for imparting training to stakeholders with special emphasis on increasing of storage, conveyance and application efficiency of irrigation projects.
   He will be assisted by Director (Admin and Planning) and Director (Finance)
   - **Director (Admin and Planning):** Responsible for overall administration, budget, capacity building and will also be responsible for implementation of Goal No.1
   - **Director (Finance):** NWM shall have separate Director (Fin) for expeditious release and utilisation of funds.
3. **ADG (NWM):** Responsible for implementation of Goal 2, 3, 4 and 5. He will be assisted by three Directors (NWM).
   - **Director (NWM)-1:** Assist ADG (NWM) in the matter of Goal 3 only.
   - **Director (NWM)-2:** Assist ADG (NWM) in the matter of Goal 4 only.
   - **Director (NWM)-3:** Assist ADG (NWM) in the matter of Goal 2 & 5 only.

Composition of Advisory Board, High Level Steering Committee and Inter-Sectoral Advisory Board is displayed from Annexures (A) – (H).

Chapter 5: Research and Development, Training and Capacity Building

One of the most important area for research and development is the "climate changes and water resources", particularly in the field of (a) impact of climate change on water resources, (b) efficacy for various measures for mitigating the impact of the projected changes in the water resources, (c) changes needed in policy & planning and management practices to optimally utilize the resources; and (d) adaptation measures, their impacts and efficacy. MoJS has duly identified the need for research in the area of impact of climate change on water resources and this area constitutes an important component of the scheme for "Research and Development" . NIH, a premier research institute in the field of hydrology has already initiated research in the area.

CWC and BB have also taken up studies in the field and have initiated actions for establishment of additional hydrological observation sites particularly those required for assessment of impact of climate change and glaciers and snowmelt. With a view to actively associate the reputed academic institutions, MoJS has also decided to establish "Professorial Chairs".

These institutions have been associated for specific studies related to impact of climate change on water resources. Indian Institute of Technology, Roorkee and National Institute of Technology, Srinagar are associated with studies in respect of Indus basin. Indian Institute of Technology, Kanpur and National Institute of Technology, Patna has been assigned with the responsibility of research and studies related to Ganga basin. Indian Institute of Technology, Guwahati and Indian Institute of Technology, Kharagpur will contribute in assessment of impact of climate change in respect of Brahmaputra basin.

MoJS has also assigned studies to Indian Institute of Science, Bangalore in respect of impact of climate change in rainfall and water resources of peninsular river basins. Depending upon the specific requirements, more institutions could be associated.

Capacity building and training of various stakeholders particularly that of Panchayati Raj Institutions, Urban Local Bodies and Water Users Association has been identified as an important activity. The capacity building for Research Institutes, Water and Land Management Institutes and Academic Institutions in various States has also been identified as an important activity under the scheme for "Research and Development" of the MoJS. Ministry has already invited proposals from various institutes in this regard.

Mass awareness programme, focused awareness programmes for policy makers and training of professionals is very important and is considered necessary for better understanding of the complex issues and identification of strategies in right perspective.

This is more so in view of the fact that the present techniques for projection of impact of climate change on water resources etc. are based on numerous assumptions and need considerable improvement.

Further, in view of considerable variation in factor affecting such changes, the techniques developed in a specific country or in a region may not be replicated. It is considered necessary to have trained professional in the area.

Although there are schemes for training in the area of water resources, it is proposed to provide additional resources for the purpose and ensure that the policy makers are fully conversant with various aspects and the professional are adequately trained to address the issues. The training programme may include study tours and specialized training abroad also. It is also proposed to associate various academic institutions, Water & Land Management Institutes and reputed Non- governmental Organizations in organizing the training and capacity building programmes.

Chapter 6: Prioritization of Strategies

Relatively very large temporal and spatial variation in rainfall and consequently in the river flow and ground water aquifers is an important feature of the water resources in India. Although the impact of climate change on water resources has not been fully and accurately quantified, various studies indicate that the likely impact of climate change on water resources could contribute to further intensification of the extreme events. The Working Group I of the IPCC, in its contribution (2021) to the Sixth Assessment Report of IPCC, has highlighted that there is high confidence that South Asia monsoon precipitation is projected to increase during the 21st century in response to continued global warming.

Further, the features of water resources – both the availability and the quality may also considerably be affected by the changes in the land use through urbanization, industrialization and changes in the forest cover.

Realizing that the various processes which influence the hydrologic cycle are of dynamic nature, precise quantification of the impact specifically due to climate change may not be a simple task and it would be necessary to make suitable assumption at the initial stages and undertake detailed simulation studies with more and more data as they become available with time. However, the likely implications of climate change on water resources could be in the form of:

1. Decline in the glaciers and the snowfields in the Himalayas;
2. Increased drought like situations due to overall decrease in the number of rainy days in many parts of the country;
3. Increased flood events due to overall increase in the rainy day intensity;
4. Effect on groundwater quality in alluvial aquifers due to increased flood and drought events;
5. Influence on groundwater recharge due to changes in precipitation and evapo-transpiration; and
6. Increased saline intrusion of coastal and island aquifers due to rising sea levels.

From the above, it is apparent that in the context of likely impact of climate change on water resources the most vulnerable areas in India would include (a) drought prone areas, (b) flood prone areas, (c) the coastal regions, (d) the region with deficient rainfall, (e) areas with over-exploited, critical and semi-critical stage of ground water development, (f) water quality affected areas, and (g) snow-fed river basins.

The degree of impact would vary considerably from one region to the other depending upon numerous factors including the topographic, hydro meteorological and socio-economic profile of the region and accordingly the choice of the adaptation measures would also have to be made after taking into consideration all aspects. The key

conclusions drawn in the report titled "Climate Change Impact in Drought and Flood Affected Areas: Case Studies in India" are:

1. Good development is also good adaptation policy;
2. High risks call for greater income diversification – need for finding new instruments for promoting income diversification;
3. Climate change cuts across sectoral boundaries; and
4. There is need to build greater linkages between sectors and integrate many excellent programmes already in existence.

The report has recommended the following strategies that would help in reducing the exposure to climate risks and in building adaptive resilience.

1. Strengthening climate information system and mechanism
2. Fostering climate-resilient reforms in agriculture and water resources management
3. Supporting the management of climate risks with economic mechanism and instruments
4. Improving institutional capabilities and linkages in sectoral programmes.

Various issues related to the impact of climate change on water resources are duly addressed under different strategies identified to achieve the five goals of the National Water Mission. However, it is necessary to priorities the various strategies particularly with a view to address the specific areas which are likely to be affected adversely by the likely impacts of the climate change.

Needless to say, the first and the foremost priority is to put in place a suitable mechanism for operationalizing the National Water Mission for coordinated actions for addressing the impact of climate change on water resources. It was proposed to create a dedicated Mission Secretariat in the Ministry of Jal Shakti which will coordinate the various actions. Mission Secretariat had already been established. Further, the following specific action points have been identified to be taken up on priority.

A. Research, Studies & Capacity Building

- Research and studies on all aspects related to impact of climate change on water resources including quality aspects of water resources with active collaboration of all research organizations working in the area of climate change.
- Promotion of research in area of increasing water use efficiency in agriculture, industry and domestic sector.
- Promote Pilot projects for improvement in water use efficiency in collaboration with States with focus on areas vulnerable to climate change.

- Capacity building and awareness programme including those for Panchayati Raj Institutions, Water Users' Associations, urban local bodies dealing with water and primary users with active involvement of NGOs.

B. Improvement in Management Practices

- Promote participatory irrigation management.
- Encourage participation of NGOs in various activities related to water resources management, particularly in planning, capacity building and mass awareness.
- Encourage corporate sector / industries to take up support and promote water conservation, augmentation and preservation within the industry and part of corporate social responsibility.
- Incentivize use of efficient irrigation practices and fully utilize the created facilities.

C. Expeditious Implementation of Specific Strategies

- Promotion of traditional system of water conservation.
- Promotion of sahi fasal concept to nudge farmers to grow less water intensive crops and to increase awareness about suitable environment and markets for these crops.
- To encourage States to establish a "district rain water harvesting & artificial recharge structure cell" or "Jal Shakti Kendra" at their district headquarters for technical support and guidance.

D. Policy & Planning

- Promotion of guidelines for different uses of water e.g. irrigation, drinking, industrial etc. particularly in context of basin-wise situations.
- Planning on the principle of integrated water resources development and management – planning of water resources from national perspective for meeting the requirements for various purposes particularly the drinking water and food production with due consideration to the environmental issues.

E. CWMI

Water is a State subject. Its optimal utilization and management lies within the domain of the States. Interventions in water sector projects are planned, funded, executed and maintained by the State Governments as per their resources and priorities. Role of Government of India is mainly catalytic, providing technical support and financial assistance in terms of the existing schemes.

NITI Aayog, in association with Ministry of Jal Shakti and Ministry of Rural Development brings out the Composite Water Management Index (CWMI) since 2018 reinforcing the spirit of competitive and cooperative federalism in the country. CWMI

is a tool to assess and improve the performance in efficient management of water resources. CWMI will continue to be published by NITI Aayog and will be utilized by NWM/ other organization of Ministry of Jal Shakti in encouraging States for adopting optimal water management practices.

F. Quantifiable Targets

It may be noted that the Sustainable Development Goals (SDGs), which are concerned with conservation of water, do not have any quantitative indicators attached to them. The nature of goals and targets of NWM are primarily focused on the promotion of water conservation practices, promotion of increasing water use efficiency in all sectors and the formulation of integrated water resource management plans for all State and UTs.

While quantifiable targets can be decided under various schemes by the concerned Department of the State Governments and the Central Government, NWM will play a promotional and supportive role.

Annexure A: Composition of Advisory Board under the Chairmanship of Union Minister of Water Resources

1	Minister of Jal Shakti	Chairman
2 to 6	Minister In charge of Water Resources from 5 States/UTs [by rotation for 2 years]	Member
7	Finance Secretary (or nominee)	Member
8	Principal Advisor, NITI Aayog	Member
9	Secretary, Department of Water Resources, RD & GR (or nominee)	Member
10	Secretary, Ministry of Science & Technology (or nominee)	Member
11	Secretary, Department of Agriculture and Cooperation (or nominee)	Member
12	Secretary, Ministry of Environment and Forests (or nominee)	Member
13	Secretary, Department of Drinking Water & Sanitation (or nominee)	Member
14	Secretary, Ministry of Urban Development (or nominee)	Member
15	Secretary, Ministry of Earth Sciences (or nominee)	Member
16	Secretary, D/o WR, RD & GR, Ministry of Jal Shakti	Member
17	Secretary, Ministry of Rural Development	Member
18	Secretary, Department of Industrial Policy & Promotion	Member
19	Secretary, Ministry of Panchayati Raj	Member
20 to 22	3 Experts on water resources [preferably one each on surface water, ground water & planning] by rotation for 2 years	Member
23 to 25	Representatives of 3 NGOs actively associated with water resources [by rotation for 2 years]	Member
26 to 28	Representatives of 3 organizations representing industries, professional organization etc. [CII, FICCI,Chamber of Commerce, Association of Pump Manufacturers, IWRS, IAH etc.] by rotation for 2 years	Member
29	Additional Secretary, DoWR, RD & GR	Member

30	Chairman, Central Water Commission	Member
31	Chairman, Central Ground Water Board	Member
32	JS&FA, D/o WR, RD & GR, Ministry of Jal Shakti	Member
33	Additional Secretary & Mission Director , NWM	Member - Secretary

Annexure B: Composition of High Level Steering Committee for National Water Mission

1	Secretary, Department of Water Resources, RD & GR	Chairman
2	Finance Secretary (or nominee)	Member
3	Principal Advisor, NITI Aayog	Member
4	Secretary, Ministry of Science and Technology (nominee)	Member
5	Secretary, Department of Agriculture and Cooperation (or nominee)	Member
6	Secretary, Ministry of Environment and Forests (or nominee)	Member
7	Secretary, Department of Drinking Water and Sanitation (or nominee)	Member
8	Secretary, Ministry of Urban Affairs and Housing	Member
9	Secretary, Ministry of Rural Development (or nominee)	Member
10	Secretary, Ministry of Earth Sciences	Member
11	Secretary, Department of Industrial Policy and Promotion	Member
12	Secretary, Ministry of Panchayati Raj	Member
13	Secretary, Department of Science and Technology	Member
14	Director, National Centre for Medium Range Weather Forecasting	Member
15	Director, India Meteorological Department	Member
16 to 17	Representatives of two NGOs (by rotation for a period of 2 years)	Member
18 to 19	Representatives of two Professional Organizations (by rotation for a period of 2 years)	Member
20 to 21	2 Experts/representatives of Academic Institutions (by rotation for a period of 2 years)	Member
22 to 26	Principal Secretary/ Secretary of Water Resources of Five State Governments/UTs (by rotations for 2 years)	Member
27	Chairman, Central Water Commission	Member
28	Additional Secretary, D/o WR,RD & GR, MoJS	Member
29	Chairman, Central Ground Water Board	Member
30	Director, Brahmaputra Board	Member
31	Director, National Institute of Hydrology	Member
32	Director, Central Water and Power Research Station	Member
33	Director, Indian Institute of Tropical Meteorology	Member

34	Joint Secretary and Financial Advisor, D/o WR, RD & GR	Member
35	Commissioner (Projects), D/o WR, RD & GR	Member
36	Commissioner (CAD), D/o WR, RD & GR	Member
37	Additional Secretary and Mission Director, NWM	Member - Secretary

Annexure C: Composition of the Inter-sectoral Advisory Group for Goal-I: Comprehensive Water Data Base in Public Domain

1	Chairman, Central Water Commission	Chairman
2	Secretary, Ministry of Earth Sciences	Member
3	Additional Secretary, D/o WR, RD & GR MoJS	Member
4	Chairman, Central Ground Water Board	Member
5	Representative from Ministry of Rural Development	Member
6	Representative from Ministry of Agriculture	Member
7	Representative from Ministry of Environment and Forests	Member
8	Representative from Ministry of Science and Technology	Member
9	Representative of Department of Drinking Water & Sanitation	Member
10	Representative of Department of Space	Member
11 to 15	Representatives of 5 States (by rotation for 3 years each)	Member
16	A representative of Indian Institute of Technology, Delhi	Member
17	Director, National Institute of Hydrology	Member
18	Commissioner (PP), D/O WR, RD & GR, Ministry of of Jal Shakti	Member
19	Representative of National Water Mission	Member
20	Joint Secretary, National Water Informatics Centre (NWIC)	Member - Secretary

Annexure D: Composition of the Inter-sectoral Advisory Group for Goal-2: Assessment of Impact of Climate Change on Water Resources

1	Chairman, Central Water Commission	Chairman
2	Secretary, Ministry of Earth Sciences	Member
3	Additional Secretary, D/o WR, RD & GR MoJS	Member
4	Chairman, Central Ground Water Board	Member
5	Representative from Ministry of Rural Development	Member
6	Representative from Ministry of Agriculture	Member
7	Representative from Ministry of Environment and Forests	Member
8	Representative from Ministry of Science and Technology	Member
9	Representative of Department of Drinking Water & Sanitation	Member
10	Representative of Department of Space	Member
11 to 15	Representatives of 5 States (by rotation for 3 years each)	Member
16	A representative of Indian Institute of Technology, Delhi	Member
17	Commissioner (PP), D/O WR, RD & GR, Ministry of of Jal Shakti	Member
18	Representative of National Water Mission	Member
19	Director, National Remote Sensing Centre, ISRO	Member
20	Director, National Institute of Hydrology	Member-Secretary

Annexure E: Composition of the Inter-sectoral Advisory Group for Goal-3: Promotion of Citizen and State Action for Water Conservation & Focused Attention to Vulnerable Areas including Over Exploited Areas

1	Secretary, D/o WR, RD, GR	Chairman
2	Additional Secretary, D/o WR, RD & GR	Member
3	Chairman, Central Water Commission	Member
4	Chairman, Central ground Water Board	Member
5	Representative from Ministry of Rural Development	Member
6	Representative from Ministry of Agriculture	Member
7	Representative from NRAA	Member
8	Representative from Ministry of Environment and Forests	Member
9	Representative from Ministry of Housing and Urban Affairs	Member
10	Representative from Department of Drinking Water and Sanitation	Member
11	Representative from Ministry of Panchayati Raj	Member
12	Representative from Department of Industrial Policy and Promotion	Member
13 to 14	Representatives of 2 NGOs (nominated by Chairman	Member
15	Representative of NITI Aayog	Member
16-20	Development Commissioners of 5 States (by rotation for 3 years each)	Member
21	JS (A), D/o WR, RD & GR, Ministry of Jal Shakti	Member
22	Commissioner (PP), D/o WR, RD & GR, Ministry of Jal Shakti	Member
23	Member (WP & P), Central Water Commission	Member
24	Member (SML) Central Ground Water Board	Member
25	Additional Secretary and Mission Director, NWM	Member - Secretary

Annexure F: Composition of the Inter-sectoral Advisory Group for Goal-4: Increasing Water use Efficiency by 20%

1	Secretary, D/o WR, RD & GR, Ministry of Jal Shakti	Chairman
2	Additional Secretary, D/o WR, RD & GR	Member
3	Chairman, Central Water Commission	Member
4	Chairman, Central Ground Water Board	Member
5	Representative from Ministry of Agriculture	Member
6	Representative from Ministry of Housing and Urban Affairs	Member
7	Representative from Ministry of Power	Member
8	Representative from Department of Drinking Water and Sanitation	Member
9	Representative from Department of Industrial Policy and Promotion	Member
10	Representative of Industries	Member
11 to 15	Representatives of 5 States (by rotation for 3 years each)	Member
16	Commissioner (PP), D/o WR, RD & GR	Member
17	Additional Secretary & Mission Director , NWM	Member - Secretary

Annexure G: Composition of the Inter-sectoral Advisory Group for Goal-5: Promotion of Basin Level and Integrated Water Resources Management

1	Secretary, D/o WR, RD & GR	Chairman
2	DG, National Mission for Clean Ganga	Member
3	Additional Secretary, D/o WR, RD & GR	Member
4	Chairman, Central Water Commission	Member
5	Representative of Ministry of Environment, Forests and Climate Change	Member
6	Director General, National Water Development Agency	Member
7 to 11	Representatives of 5 States (by rotation for 3 years each)	Member
12	Representative of NITI Aayog	Member
13	Commissioner (PR), D/o WR, RD, & GR	Member
14	Additional Secretary & Mission Director , NWM	Member - Secretary

Annexure H: Composition of Technical Committee on Climate Change and Water Resources

1	Chairman, Central Water Commission	Chairman
2	Member (River Management), Central Water Commission	Member
3	Chairman, Brahmaputra Board	Member
4	Chairman, Central Ground Water Board	Member
5	Representative of Department of Science and Tech.	Member
6	Representative of IMD	Member
7	Director, Central Water and Power Research Station	Member
8	Director, Indian Institute of Tropical Meteorology	Member
9	Director, National Institute of Hydrology	Member
10	Director, National Centre for Medium Range Weather Forecasting	Member
11 to 15	Representatives of State Government/State Government Organizations dealing with research and management in water resources (5 by rotation for 2 years)	Member
16	Representative of Ministry of Agriculture and Farmers' Welfare	Member
17	Representative of National Remote Sensing Centre, Hyderabad	Member
18	Representative of DG, IMD	Member
19	Representative of GovindBallabh (GB) Pant Institute of Himalayan Environment and Development, Koshikatamal, Almora	Member
20	Representative of DG, Survey of India	Member
21	Representative of DG, Geological Survey of India	Member
22	Representative of WadiaInstitue of Himalayan Geology, Dehradun	Member
23	Representative of Space Application Centre, Ahmedabad	Member
24	Representative of Director, Snow and Avalanche Study Establishment, Ministry of Defence	Member
25	Chief Engineer, HSP, Central Water Commission	Member
26	Representative of MS Swaminathan Research Foundation, Chennai	Member
27	Chief Engineer (P&D), Central Water Commission	Member
28	Representative of National Water Mission (NWM)	Member-Secretary

Annexure I: Action Plan and Timelines for Identified Strategies under "National Water Mission 2021-31"

S.No.	Recommended Strategies	Activities	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	Organizations to initiate the process
I	**Goal 1: Comprehensive water data base in public domain**												
1.1	Dissemination of necessary reliable data on water	NWM to act as one of the information dissemination centres/ agencies											DoWR, NWM
		Review of network of hydrological observation stations, automatic weather stations and automated rain gauge stations to assess the adequacy from time to time.											DoWR, CWC, CGWB, NIH, NWIC
		Development of a data sharing portal including server											DoWR, CWC, CGWB, NIH, NWIC
		Listing of organizations working in particular field such as Groundwater, Surface water, Climate Change, Environmental, Forest etc. and request them about for their datasets.											DoWR& State Governments

1.2	Interaction with data users as well as get feedback from them on data usability and requirement of additional data.	Interaction with data users and getting feedback from them for improvement in collection and processing of data.											DoWR, CWC, CGWB, NIH, NWIC, MoEFCC, MoUD, MoRD, Niti Aayog
		Ensuring data transparency except for sensitive and classified nature, all data would be in public domain and easily available to public to facilitate and promote citizen action in water conservation, augmentation and preservation.											DoWR
2	**Goal 2: Assessment of the impact of climate change on water resource**												
2.1	Research and studies on all aspects related to impact of climate change on water resources including water storage, Flooding, drought, water quality and public health with active	Research and studies on all aspects related to impact of climate change on water resources including water storage, monsoons, flooding, drought, water quality and public health with active collaboration of all research organizations working in the area of climate change											R&D, NWM

	collaboration of all research organizations working in the area of climate change as per the guidelines mandated by Inter-Governmental Panel of Climate Change (IPCC), NDCs and SDGs.	(i) as per the guidelines mandated by Inter-Governmental Panel of Climate Change (IPCC), NDCs and SDGs. (ii) Involving researchers, professionals, private firms for larger climate change analysis. (iii) In the projects/studies facilitated by NWM, for real time forecast models/climate change models, contributions may be taken from other government organisations (such as ISRO, MoES, etc.) (iv) Studies could include research related to 'Crop Water Requirement												
		b. Development of district level water resources inventories including the information of reservoirs (Small and large), streams, Dams,												R&D, NWM

		canals, rivers, water used for various purposes.											
		c. Research and Study of State level/basin level Water-energy-Climate Change relationships including both urban and rural area.											MoUD
		d. Finding datasets about impact of climate change on water resources collected by various organizations working in the respective fields. Dissemination of Data to users on climatechange.											NWM, MoHFW
		e. Making available all Research and Development based studies funded by NWM, available in the public domain, as and when completed"											
2.2	Projection of the impact of climate change on water resources	Yearly projection of water resources availability sector wise as a result of impact of climate change which											NWM, NHP, CWC

		would inter-alia include the likely changes in the characteristics of water availability in time and space with focus on areas vulnerable to climate change. It also includes policy advocacy based on climate change impact on water resources.											
		Projection of the impact of climate change on water resources as per the guidelines mandated by Inter-Governmental Panel of Climate Change (IPCC) and latest Representative Concentration Pathway (RCP) scenario.											NWM, NWIC
2.3	Improvement in water governance for mitigation of impact of climate change on water resources	Impact of Climate Change on water governance and gender equity need to be analyzed based on water demand and supply change due to uncertain droughts and floods.											NWM, State WRDs, TISS

3	**Goal 3: Promotion of Citizen and State Action for Water Conservation & Focused Attention to Vulnerable Areas including Over Exploited Areas**												
3.1	Capacity building to empower and involve Panchayati Raj Institutions, urban local bodies, Water User's Associations (WUA) and other stake holders in the management of water resources with focus on water conservation, augmentation and preservation	Capacity building & Sensitization of all Panchayati Raj membersand their functionaries, ULBs and WUAs in Water vulnerable & water stressed areas by 2020-2022.											MoPR, DoWR, State Governments
		Capacity Building of organizations associated with water resources development and management.											DoWR, CWC, CGWB
		Promotion of do-it-yourself action by citizens through intensive social communication with active involvement of NGOs.											DoWR
3.2	To promote & encourage participatory irrigation management; PIM) with active involvement and support of CADA (Command Area	Encourage participatory irrigation management through "Command Area Development and Water Management Programme" with active involvement and support of CADA (Command Area Development											DoWR

	Development Authority) & State Irrigation departments.	Authority) & State Irrigation departments.											
		Encourage States to enact appropriate Participatory Irrigation Management (PIM) Act.											DoWR& State Governments
3.3	Sensitization of elected representatives and stakeholders of over-exploited areas & water resource vulnerable areas viz. flood prone zone, Wetland zones, & Springs on dimensions of the Water resource & scarcity problems and to orient investment under MGNREGA	Sensitization & capacity building of elected representatives of over-exploited areas & water resource vulnerable areas viz. flood prone zone, Wetland zones, & Springs on dimensions of the Water resource & scarcity problems and to orient investment under MGNREGA towards water conservation											DoWR

	towards water conservation;												
3.4	To promote & Provide incentives for water neutral and water positive technologies in industry ;	To organize training & capacity building programs for the industries & corporate sector to aware them about water positive & water neutral technologies											MoCI
		To promote & provide incentives for water neutral and water positive technologies including attractive fiscal package.											MoUD, MoCI
		To promote & provide incentives for water neutral and water positive technologies in industry											MoUD, MoCI, MoEF
		Encourage and Incentivize the reuse of treated effluents.											MoUD, MoCI

3.5	To promote, incentivize & encourage participation of NGOs in various activities related to water resources management, particularly in planning, capacity building and mass awareness;	To promote, incentivize & encourage participation of NGOs in various activities related to water resources management, particularly in planning, capacity.											DoWR, MoCI
3.6	To promote & encourage the involvement of corporate sector / industries to take up, support and promote water conservation, augmentation and preservation within the industry and as a part of their corporate social responsibility (CSR).	To organize training & capacity building programs for the industries & corporate sector to aware them about activities which can be acquired under CSR for water conservation, preservation & augmentation.											MoCI, MoUD, DoWR
3.7	Promotion of water conservation by	Awareness Drives to make check dams,											MoRD, MoPR, DoWR, MoUD

	Rain water harvesting & artificial recharge structures.	water harvesting pits, rooftops RWHS.											
		To initiate a "Catch the Rain" campaign in different schools, colleges, universities, offices, institutes etc. of the district to make them aware and build their capacity about the importance of Rain Water Harvesting for water conservation, preservation and augmentation.											
		Expeditious implementation of programme for construction, repair, renovation and restoration of water bodies in areas / situations sensitive to climate change by (i) Increasing capacity of minor tanks, and (ii) Rehabilitating water bodies, with changed focus.											
		To promote the use of defunct bore-wells as Rain water recharge structures.											

3.8	To encourage states to establish a "district rain water harvesting & artificial recharge structure cell" at their district headquarters for technical support and guidance.	To encourage states to establish a "district rain water harvesting & artificial recharge structure cell" at their district headquarters for technical support and guidance.											DoWR, MoRD, MoPR, State Governments
3.9	Promotion of social Communication, social media & digital media for water conservation.	Promotion of social Communication, social media & digital media for water conservation											
3.10	Promotion of traditional system of water conservation	Promote Expeditious implementation of programme for repair, renovation and restoration of water bodies such as Dug Well, Step Wells, Baulis, Ponds, Lakes, etc. in areas / situations vulnerable to water stress by Promoting knowledge base and awareness											DoWR& State Governments

3.11	Promotion of physical sustainability of ground water resources	Promote Active community participation in ground water recharging including rainwater harvesting with special emphasis in over exploited, Critical and Semi critical areas, monitoring, regulation & management.											MoA, MoRD, DoWR, CGWB
		Promotion of a Panchayat / district level model for ground water regulation.											
		Promote and provide incentive for adopting and sustaining rain water harvesting systems including roof top rain water harvesting system.											
3.12	Promotion of Intensive programme for ground water recharge in over-exploited, critical and semi-critical areas	Promote ground water recharging including rainwater harvesting with special emphasis in over exploited, Critical and Semi critical areas. Encouraging Expansion of programme for recharge of ground water through dug well.											MoRD, CGWB, MoUD, MoPR

		Promoting expeditious implementation of programme for conservation of water through recharge of GW including rainwater harvesting in over-exploited, critical and semi-critical areas including (i) facilitating preparation of state-wise implementation plan for RWH & AR based on Master Plan of CGWB (ii) Implementation of rain water harvesting and artificial recharge with special attention to over exploited areas and their impact assessment, and (iii) Identify and promote incentives for adopting and sustaining roof top rain water harvesting systems.											State Governments
3.13	Innovation and cost effective water	To promote assessing and study of quality of Water.											M/o Earth Science, DST

	purification technologies	To Promote,research for development of cost effective water purification technologies.											MoUD
Goal 4: Increasing Water use Efficiency by 20%													
4.1	Research in area of increasing water use efficiency and maintaining its quality in agriculture, industry and domestic sector;	To develop water efficiency guidelines for Agriculture and Industry sector based on the recommendations received from baseline studies and benchmarking studies.											CWC
		To open a research call to develop new yet actionable methodologies to increase WUE in all sectors											CWC, CGWB
		To collaborate with Academia/ Universities and Institutes to provide research and innovation in water use efficiency.											DoWR, NWM
		Research in the field of crop market in order to link crop production and variety with respect to the water availability, region wise											CWC

		Demand side water management in all three sectors putting more emphasis on agricultural and industrial sectors.											CWC
4.2	To promote the recycling of water including wastewater, and water efficient techniques and technologies	Incentivize recycling of wastewater, and using eco-friendly methods for recycling											CPCB
		To work closely with Ministry of Urban Development and CPCB and become member of internal committees for these Ministries to sought inputs.											NWM
		Incorporate component of incentivizing recycling of wastewater in Agriculture in the Sahi-Fasal campaign											NWM
		To provide appropriate space to show case new and innovative technologies on recycling of water in various events organized by NWM including Water-Talk.											NWM
		Stakeholder consultation with various industry groups/NGOs/Researc											NWM/R&D

		h firms and to prepare a basket of sector-wise water efficient techniques for further guiding states.											
4 3	To promote efficiency of urban water supply system	To initiate benchmarking studies for urban water use and introduce concept of water efficiency index for urban areas											MoUD, NWM
		To work closely with Ministry of Housing and Urban Affairs and to promote the findings or any guidelines prepared by them.											MoUD
4.4	Promotion of efficiency labeling of water appliances, sanitary fittings and fixtures in collaboration with BIS.	To work closely with BIS to promote efficiency labelling of water appliance and sanitary fittings											NWM
		To promote the reduction of non-revenue water by encouraging 100% metering											MoUD
		To provide appropriate space to show case new and innovative technologies on recycling of water in various events organized by NWM including Water-Talk											NWM

4.5	Undertake Pilot projects for improvement in water use efficiency in collaboration with States;	Call for project proposals from states sector wise**a**nd promote the implementation of advanced technologies and IWRM approaches in field technologies and in decision-making												NWM
4.6	Promote Water Regulatory Authorities for equitable distribution and nominal charges for water facilities;	To study water regulatory authorities state wise and to develop guidelines to establish WRA in each states through State Water Mission.												NWM
4.7	Setting up the National Bureau of Water Use Efficiency (NBWUE)	Taking up a case for approval of Cabinet for setting up of a National Bureau of Water Use Efficiency(NBWUE)												NWM
		Issuing of certificates for water-use efficiency as a tool for raising awareness												

		and incentivising best practices											
4.8	To promote use of efficient irrigation practices and fully utilize the created facilities through participatory campaigns, like "Sahi – Fasal" that aimed to nudge farmers to grow less water intensive crops and to increase awareness about suitable environment and markets for these crops.	To conduct Workshop on WUE in Agriculture sector in every water stressed region											CWC
		To promote incentivized and suitable market environment for the crops using less water and having good productivity											NWM/ MoA
		To encourage farmers, organisations and district who are following efficient irrigation practices during different campaigns or events at state level while working closely with CWC											NWM
4.9	Undertake pilot projects for demonstrating the Sahi-Fasal concept with the help of NGOs, district	Call for proposals in order to implement the Sahi-Fasal campaign and to see the impact on change in cropping pattern with respect to the water availability at district level.											NWM

	and state level authorities												
		Assess action taken by different states/ organisation and popularising the findings as good practices.											
		Assess action taken by different states/ organizations and popularizing the findings as good practices.											NWM
4. 10	To promote incentivizing through award for water conservation & efficient use of water	To promote incentivizing through award for efficient use of water in all three sectors & efficient irrigation practices.											NWM
5	**Goal 5: Promotion of basin level integrated water resources management**												
5.1	**Planning on the principle of integrated water resources development**	Preparation of appropriate guidelines											DoWR& State Governments, Nodal Agencies

	and management	Interaction with States											State Governments
													State Governments
5.2	**Ensuring convergence among various water resources programmes**	Expeditious formulation of the projects for utilization of surplus flood water for beneficial use of the society and implementation of projects after evaluating costs and land acquisition problems											DoWR