

# **DRAFT STATE WATER POLICY & PLAN**

## **1. PREAMBLE**

- 1.1 A scarce natural resource, water is fundamental to life, livelihood, food security and sustainable development. There are further limits on utilizable quantities of water owing to uneven distribution over time and place. In addition, there are challenges of frequent floods and droughts in one or the other part of the State. With a growing population and rising needs of water in the State as well as the given indications of the impact of climate change, availability of utilizable water will be under further strain in future with the possibility of deepening water conflicts among different user groups. Low consciousness about the scarcity of water and its life sustaining and economic value results in its mismanagement, wastage, and inefficient use, as also pollution and reduction of flows below minimum ecological needs. In addition, there are inequities in distribution and lack of a unified perspective in planning, management and use of water resources. The objective of the State Water Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and for a plan of action.
- 1.2 In terms of Section 4 of the J&K State Water Resources (Regulation & Management) Act, 2010, the State Water Policy and Plan shall have the following objectives:
- (a) the availability of water;
  - (b) the demand of water for diverse purposes such as domestic, agriculture, power, industry etc;

- (c) the obligations of the State under any agreement, treaty, judgment or order of any court or tribunal, or statutory obligations under any law for the time being in force in the State.
- (d) the ecological system and environmental concerns;
- (e) the conservation and management of available water resources in most economical and sustainable manner;
- (f) the drought and flood management on scientific basis;
- (g) the planning and management of irrigation and multipurpose projects involving varied socio-economic aspects such as environmental sustainability, resettlement and rehabilitation of project affected people and live-stock etc;
- (h) ensuring sustainable and conjunctive use of surface and ground water ;
- (i) the development and improvement of ground water and prevention of its over exploitation;
- (j) promoting efficiency in water utilization for various sectoral purposes;
- (k) promotion, conservation and augmentation of traditional water resources;
- (l) use of scientific and innovative techniques for prevention and reduction of pollution of surface and ground water resources and improvement in quality of water;
- (m) training and capacity building of personnel involved in the management and development of water resource;
- (n) extension and improvement in irrigation facilities and focus on efficiency in utilization of water for crop production to increase production and productivity in agriculture sector;
- (o) promotion of crops which require less water as against the water intensive crops;
- (p) the development of information system to collect, process and provide data regarding the availability of water, actual use of

water for different purposes, the future demands of water for diverse purposes, hydraulic data with emphasis on the use of modern technology including remote sensing techniques;

- (q) the establishment of a network of data banks and data bases using modern computer technology and exchange of data among the various agencies ;
- (r) the development of an effective institutional mechanism for coordinating the management of water resources on a hydrological unit basis with a multi sectoral and multi disciplinary approach;
- (s) the measures aimed at maximizing retention and minimizing loss of water by watershed management through extensive soil conservation, catchment area treatment, preservation of forests and wet lands, increasing the forest cover, construction of check dams and other ground water recharge measures;
- (t) non-conventional measures such as artificial recharge of ground water and traditional water conservation practices like rain water harvesting including promotion of roof top rainwater harvesting;
- (u) encouragement of re-cycling and reuse of water ;
- (v) prioritisation of water allocation broadly in the following order but subject to modification if so warranted by area/situation specific considerations :-
  - (i) drinking water including washing & bathing;
  - (ii) irrigation;
  - (iii) generation of electricity;
  - (iv) ecology; and
  - (v) agro Industries and non-agricultural industries;
- (w) planning and development of water resources as multi-purpose projects with provision for drinking water as an integral component, irrigation, flood control, navigation, hydroelectric power generation, pisciculture and recreation, wherever possible;

- (x) integrated and multi-disciplinary approach to planning, formulation, clearance, implementation and monitoring of water projects and schemes;
- (y) emphasis on drinking water as the first charge on any available water resource;
- (z) establishment of a network of water quality testing laboratories at the district level to ensure the water quality and regular monitoring in terms of parameters laid down by Government of India from time to time so as to ensure that the health of the people is not affected adversely;
- (za) generation of public awareness about the standards of water quality and the likely impact on health of people due to possible contamination;
- (zb) prevention of encroachment on existing water bodies and deterioration of water quality in such water bodies due to pollution;
- (zc) treatment of effluents, solid/ gaseous wastes which are discharged into the natural streams, water bodies and have the potential of contaminating the ground water through seepage, leaching to acceptable standards before these are released from the industries, institutions, residential and commercial areas;
- (zd) planning of irrigation projects taking into account the irrigability of the land, cost effective irrigation options possible from all available sources of water and appropriate irrigation techniques for optimizing water use efficiency;
- (ze) preparation of basin master plan to assess the water needs for various uses and also to assess the potential resources so as to prioritise the water resource development;
- (zf) ensuring close linkage between water-use and land-use policies and obviating disparities in availability of water between head-reach and tail end farms and between large and small farms by adopting distribution system and supply of water to families on a volumetric basis subject to certain ceilings and rational pricing;

- (zg) adoption of command area development approach to ensure that irrigation potential created is fully utilized and the gap between potential created and potential utilized is removed;
- (zh) fixation and revision of water rates to cover at least the operation and maintenance charges linked to the quality of service provided;
- (zi) usage charges of water made available for drinking purposes (domestic, commercial, institutional) or for irrigation to farmers on volumetric basis with a view to discourage excessive and wasteful use of water;
- (zj) involvement of users, farmers and voluntary organizations in various aspects of planning, design, development and management of water resource schemes (both for drinking water and irrigation);
- (zk) involvement of user associations, local bodies and other voluntary agencies in operation, maintenance and management of schemes or parts of schemes with a view to eventually transfer these to the user groups and local-bodies;
- (zl) empowerment of such user groups and local bodies to collect water charges and delegation of specific functions, necessary for effective management of the schemes;
- (zm) division of the State into water zones to ensure proper planning and development of water resources ;
- (zn) optimum efficiency and utilization of hydro-potential for constructing hydro-electric projects with a view to ensuring generation of maximum power, revenue and local employment;
- (zo) promotion of water conservation consciousness through education, awareness building, regulation, incentives and disincentives;
- (zp) private sector participation in planning and development of water resources projects particularly power projects, which may help in generating financial resources and improving efficiency;

- (zq) framing of uniform guidelines for resettlement and rehabilitation of project-affected persons and setting up of a grievance redressal mechanism with active participation of affected persons;
- (zr) periodical assessment of the ground water potential on scientific basis to estimate the availability of water and the economic viability of extraction;
- (zs) regulating the exploitation of ground water resources to ensure that it does not exceed recharging limits ;
- (zt) preparation of a master plan for flood prone areas with a view to control floods and provide protection;
- (zu) establishment of an extensive network for flood forecasting for giving timely warning to the people likely to be affected;
- (zv) promotion of watershed management through extensive soil conservation, catchment area treatment, preservation of forests, increasing the forest area and the construction of check dams to increase infiltration rate and to reduce the intensity of floods;
- (zw) imposition of complete ban on encroachment on water bodies, wetlands, water courses, and reclamation of such water bodies, wetlands and water courses;
- (zx) promotion of suitable cost effective measures to minimize the erosion of land by streams;
- (zy) encouragement of measures like soil moisture conservation, water harvesting, works aimed at increasing the ground water potential by recharging and transfer of surface water from the surplus areas for reducing the problems and severeness related to drought ;
- (zz) development of grazing fields and encouragement of afforestation to improve drought management ;
- (zza) setting up of a proper organisational arrangement at the State level consisting of specialists in investigation, design,

construction, hydrology, geology etc. for ensuring safety of storage dams and other water related structures;

(zzb) monitoring of water resource projects to identify bottlenecks and to adopt timely remedial measures ;

(zzc) evolution of a system for evaluating the socio economic and environmental impact of projects ;

(zzd) periodical audit of the working systems to check the sustainable losses taking place between storage, distribution and usage points;

(zze) encouragement of research particularly in the fields of hydro-meteorology, assessment of water resources, snow and lake hydrology, ground water hydrology and recharge, water-harvesting, evaporation and seepage losses, economic designs for water resources projects, crops and cropping systems, sedimentation of reservoirs, safety and longevity of water-related structures, river morphology and hydraulics, soils and material research, better water management practices and improvements in operational technology, recycling and re-use, seismology and seismic design of structures and the use of remote sensing technology in development and management;

1.3 The present scenario of water resources and their management in the State has given rise to several concerns, important amongst them are;

- i) Some parts of the State have become water stressed. Rapid growth in demand for water due to population growth, urbanization and changing lifestyle pose serious challenges to water security;
- ii) There is wide temporal and spatial variation in availability of water, which may increase substantially due to a combination of climate change, causing deepening of water crisis and incidences of water related disasters, i.e. floods, increased erosion and increased frequency of droughts, etc.
- iii) Access to safe water for drinking and other domestic needs still continues to be a problem in many areas. Skewed availability of

- water between different regions and different people in the same region and also the intermittent and unreliable water supply system has the potential of causing social unrest.
- iv) Groundwater, though part of hydrological cycle and a community resource, is still perceived as an individual property and is exploited inequitably and without any consideration to its sustainability.
  - v) Water resources projects, though multi-disciplinary with multiple stakeholders, are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environment sustainability and holistic benefit to the people.
  - vi) Inter-regional, inter-state, intra-state, as also inter-sectoral disputes in sharing of water, strain relationships and hamper the optimal utilization of water through scientific planning on basin/sub-basin basis.
  - vii) Grossly inadequate maintenance of existing irrigation infrastructure has resulted in wastage and under-utilization of available resources. There is a widening gap between irrigation potential created and utilized.
  - viii) Natural water bodies and drainage channels are being encroached upon, and diverted for other purposes. Groundwater recharge zones are often blocked.
  - ix) Growing pollution of water sources, especially through industrial effluents, is affecting the availability of safe water bodies causing environmental and health hazards. In many parts of the state, large stretches of rivers are both heavily polluted and devoid of flows to support aquatic ecology, cultural needs and aesthetics.
  - x) Access to water for sanitation and hygiene is an even more serious problem. Inadequate sanitation and lack of sewage treatment are polluting the water sources.
  - xi) Low consciousness about the overall scarcity and economic value of water results in its wastage and inefficient use.
  - xii) The lack of adequate trained personnel for scientific planning, utilizing modern techniques and analytical capabilities



- incorporating information technology constrains good water management.
- xiii) A holistic and inter-disciplinary approach at water related problems is missing.
  - xiv) The public agencies in charge of taking water related decisions tend to take these on their own without consultation with stakeholders, often resulting in poor and unreliable service characterized by inequities of various kinds.
  - xv) Characteristics of catchment areas of streams, rivers and recharge zones of aquifers are changing as a consequence of land use and land cover changes, affecting water resource availability and quality.
- 1.4 Public policies on water resources need to be governed by certain basic principles, so that there is some commonality in approaches in dealing with planning, development and management of water resources. These basic principles are:
- i. Planning, development and management of water resources need to be governed by common integrated perspective considering local, regional, State and national context, having an environmentally sound basis, keeping in view the human, social and economic needs.
  - ii. Principle of equity and social justice must inform use and allocation of water.
  - iii. Good governance through transparent informed decision making is crucial to the objectives of equity, social justice and sustainability. Meaningful intensive participation, transparency and accountability would guide decision making and regulation of water resources.
  - iv. Water needs to be managed as a common pool community resource held, by the state, under public trust doctrine to

achieve food security, support livelihood, and ensure equitable and sustainable development for all.

- v. Water is essential for sustenance of eco-system, and therefore, minimum ecological needs would be given due consideration.
- vi. Safe Water for drinking and sanitation would be considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system needs. Available water, after meeting the above needs, would be allocated in a manner to promote its conservation and efficient use.
- vii. All the elements of the water cycle, i.e., evapo-transpiration, precipitation, runoff, river, lakes, soil moisture, and ground water, sea, etc., are interdependent and the basic hydrological unit is the river basin, which would be considered as the basic hydrological unit for planning.
- viii. Given the limits on enhancing the availability of utilizable water resources and increased variability in supplies due to climate change, meeting the future needs will depend more on demand management, and hence, this needs to be given priority, especially through (a) evolving an agricultural system which economizes on water use and maximizes value from water, and (b) bringing in maximum efficiency in use of water and avoiding wastages.
- ix. Water quality and quantity are interlinked and need to be managed in an integrated manner, consistent with broader environmental management approaches inter-alia including

the use of economic incentives and penalties to reduce pollution and wastage.

- x. The impact of climate change on water resources availability must be factored into water management related decisions. Water using activities need to be regulated keeping in mind the local geo climatic and hydrological situation.”

## **2. WATER FRAMEWORK LAW**

- 2.1 The State of J&K has already enacted the Jammu and Kashmir Water Resources (Regulation & Management) Act, 2010. Further, the Rules and Regulations made thereunder consolidate the law relating to use of water, the measurement, construction, control and management of works with respect to water storage, conservation and protection, irrigation, water supply, drainage, flood control and prevention, the improvement in the flow of water, the protection and improvement in the physical integrity of water courses, lakes and springs, the safety and surveillance of dams, the establishment of the State Water Resources Regulatory Authority for regulating water resources, ensuring judicious, equitable and sustainable management, allocation and utilization of water resources, fixing the rates for use of water and matters connected therewith or incidental thereto.

## **3. USES OF WATER**

- 3.1 Water is required for domestic, agricultural, hydro-power, thermal power, navigation, recreation, etc. Utilisation in all these diverse uses of water would be optimized and an awareness of water as a scarce resource would be fostered.

- 3.2 The State would endeavour to ensure access to a minimum quantity of potable water for essential health and hygiene to all its citizens, and make it available within easy reach of each household.
- 3.3 Ecological needs of the rivers would be determined, through scientific studies, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and would accommodate developmental needs. A portion of river flows would be kept aside to meet its ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use.
- 3.4 Rivers and other water bodies would be considered for development for navigation as far as possible and all multipurpose projects over water bodies would keep navigation in mind right from the planning stage.
- 3.5 Communities would be sensitized and encouraged to adapt first to utilization of water as per local availability of waters, before providing water through long distance transfer. Community based water management would be institutionalized and strengthened.

#### **4. ADAPTATION TO CLIMATE CHANGE**

- 4.1 Climate change is likely to increase the variability of water resources affecting human health and livelihoods. Therefore, special impetus would be given towards mitigation at micro level by enhancing the capabilities of community to adopt climate resilient technological options.

- 4.2 The anticipated increase in variability in availability of water because of climate change would be dealt with by increasing water storage in its various forms, namely, soil moisture, ponds, ground water, small and large reservoirs and their combination. Local communities and local bodies would be incentivized to increase water storage capacity, which inter-alia would include revival of traditional water harvesting structures and water bodies.
- 4.3 The adaptation strategies could also include better demand management, particularly, through adoption of compatible agricultural strategies and cropping patterns and improved water application methods, such as land leveling and/or drip /sprinkler irrigation as they enhance the water use efficiency, as also, the capability for dealing with increased variability because of climate change. Similarly, industrial processes would be made more water efficient.
- 4.4 Stakeholder participation in land-soil-water management with scientific inputs from local research and academic institutions for evolving different agricultural strategies, reducing soil erosion and improving soil fertility would be promoted. The specific problems of hilly areas like sudden run off, weak water holding capacity of soil, erosion and sediment transport and recharging of hill slope aquifers would be adequately addressed.
- 4.5 Planning and management of water resources structures, such as, dams, flood embankments, tidal embankments, etc., would incorporate coping strategies for possible climate changes. The acceptability criteria in regard to new water resources projects need to be re-worked in view of the likely climate changes.

## **5. ENHANCING WATER AVAILABLE FOR USE**

- 5.1 The availability of water resources and its use by various sectors in various basins need to be assessed scientifically and reviewed at periodic intervals, say, every five years. The trends in water availability due to various factors including climate change must be assessed and accounted for during water resources planning.
- 5.2 The availability of water is limited but the demand of water is increasing rapidly due to growing population, rapid urbanization, rapid industrialization and economic development. Therefore, availability of water for utilization needs to be augmented to meet increasing demands of water.
- 5.3 There is a need to map the aquifers to know the quantum and quality of ground water resources (replenishable as well as non-replenishable) in the State. This process would be fully participatory involving local communities, and may be periodically updated.
- 5.4 Declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community based management of aquifers. In addition, where necessary, artificial recharging projects would be undertaken so that extraction is less than the recharge. This would allow the aquifers to provide base flows to the surface system, and maintain ecology.
- 5.5 Inter-basin transfers are not merely for increasing production but also for meeting basic human needs and achieving equity and social justice. Inter-basin transfers of water would be considered on the basis of merits of each case after evaluating the environmental, economic and social impacts of such transfers.

5.6 Integrated watershed development activities with groundwater perspectives need to be taken in a comprehensive manner to increase soil moisture, reduce sediment yield and increase overall land and water productivity. To the extent possible, existing programs like MGNREGA may be used by farmers to harvest rain water using farm ponds and other soil and water conservation measures. Institutions like the State Level Nodal Agency need to be fully geared up to evolve and implement a truly integrated approach to the implementation of its watershed development projects, which shall require it to reach out more actively to the Forest, PHE/ I&FC Departments.

## **6. DEMAND MANAGEMENT AND WATER USE EFFICIENCY**

- 6.1 A system to evolve benchmarks for water uses for different purposes, i.e., water footprints, and water auditing would be developed to promote and incentivize efficient use of water. The 'project' and the 'basin' water use efficiencies need to be improved through continuous water balance and water accounting studies. An institutional arrangement for promotion, regulation and evolving mechanisms for efficient use of water at basin/sub-basin level will be established for this purpose at the state level.
- 6.2 The project appraisal and environment impact assessment for water uses, particularly for industrial projects, would, inter-alia, include the analysis of the water footprints for the use.
- 6.3 Recycle and reuse of water, including return flows, would be the general norm.

- 6.4 Project financing would be structured to incentivize efficient and economic use of water and facilitate early completion of ongoing projects.
- 6.5 Water saving in irrigation use is of paramount importance. Methods like aligning cropping pattern with natural resource endowments, micro irrigation (drip, sprinkler, etc.), automated irrigation operation, evaporation-transpiration reduction, etc., would be encouraged and incentivized. Recycling of canal seepage water through conjunctive ground water use may also be considered.
- 6.6 Use of very small local level irrigation through small bunds, field ponds, agricultural and engineering methods and practices for watershed development, etc, need to be encouraged. However, their externalities, both positive and negative, like reduction of sediments and reduction of water availability, downstream, may be kept in view.
- 6.7 There would be concurrent mechanism involving users for monitoring, if the water use pattern is causing problems like unacceptable depletion or building up of ground waters, salinity, alkalinity or similar quality problems, etc., with a view to planning appropriate interventions.

## **7. WATER PRICING**

- 7.1 Pricing of water would ensure its efficient use and reward conservation. Equitable access to water for all, and its fair pricing, for drinking and other uses such as sanitation, agricultural and industrial, would be arrived at through the J&K State Water Resources Regulatory Authority, already in existence, after a



detailed analysis of data, legal provisions and appropriate consultation with the stakeholders.

- 7.2 In order to meet equity, efficiency and economic principles, the water charges would preferably / as a rule be determined on volumetric basis, and such charges would be reviewed periodically, as mandated by the J&K Water Resources (Regulation and Management) Act, 2010.
- 7.3 Recycle and reuse of water, after treatment to specified standards, would also be incentivized through a properly planned tariff system.
- 7.4 The principle of differential pricing may be retained for the pre-emptive uses of water for drinking and sanitation; and high priority allocation for ensuring food security and supporting livelihood for the poor. Available water, after meeting the above needs, would increasingly be subjected to allocation and pricing on economic principles so that water is not wasted in unnecessary uses and could be utilized more gainfully.
- 7.5 Water Users Associations (WUAs) would be organised and given statutory powers to collect and retain a portion of water charges, manage the volumetric quantum of water allotted to them and maintain the distribution system in their jurisdiction. WUAs would also be given the freedom to fix rates subject to floor rates determined by the J&K State Water Resources Regulatory Authority.
- 7.6 The over-drawal of groundwater would be minimized by regulating the use of electricity for its extraction. Separate electric feeders for pumping ground water for agricultural use would be considered.

## **8. CONSERVATION OF RIVER CORRIDORS, WATER BODIES AND INFRASTRUCTURE**

- 8.1 Conservation of rivers, river corridors, water bodies and infrastructure would be undertaken in a scientifically planned manner through community participation. The storage capacities of water bodies and water courses and/or associated wetlands, the flood plains, ecological buffer and areas required for specific aesthetic recreational and/or social needs would be managed to the extent possible in an integrated manner to balance the flooding, environmental and social issues, as per prevalent laws, through planned development of urban areas, in particular.
- 8.2 Encroachments and diversion of water bodies (like rivers, lakes, tanks, ponds, wetlands, water courses etc.) and drainage channels (irrigated area as well as urban area drainage) would not be allowed, and wherever it has taken place, it would be restored and maintained properly.
- 8.3 Urban settlements, encroachments and any developmental activities in the protected upstream areas of reservoirs/water bodies, key aquifer recharge areas that pose a potential threat of contamination, pollution, reduced recharge and those endanger wild and human life would be strictly regulated.
- 8.4 Environmental needs of our hilly regions, aquatic eco-systems, wet lands and embanked flood plains need to be recognized and taken into consideration while planning.
- 8.5 Sources of water and water bodies would not be allowed to get polluted. System of third party periodic inspections would be evolved and stringent punitive actions taken under existing laws against the persons responsible for causing pollution.

- 8.6 Quality conservation and improvements are even more important for ground waters, since cleaning up is very difficult. It needs to be ensured that industrial effluents, local cesspools, residues of fertilizers and chemicals, etc., do not reach the ground water.
- 8.7 The water resources infrastructure would be maintained properly to continue to get the intended benefits. A suitable percentage of the costs of infrastructure development may be set aside along with collected water charges, for repair and maintenance. Contract for construction of projects would have inbuilt provision for longer periods of proper maintenance and handing over back the infrastructure in a good condition.
- 8.8 Legally empowered dam safety services need to be ensured, and appropriate safety measures, including downstream flood management, for each dam would be undertaken on top priority.

## 9. **INFORMATION SYSTEM**

- 9.1 The prime requisite for resource planning is a well-developed information system. A standardized information system would be established with a network of data banks and data bases, integrating and strengthening the existing central and state level agencies and improving the quality of data and the processing capabilities.
- 9.2 Standards for coding, classification, processing and methods/procedures for data would be adopted. Advances in information technology must be introduced to create a modern information system promoting free exchange of data among the various agencies. Special efforts would be made to develop and

continuously upgrade technological capability to collect process and disseminate reliable data in the desired time frame.

9.3 Apart from the data regarding water availability and actual water use, the system would also include comprehensive and reliable projections of future demands of water for diverse purposes.

## 10. **WATER RESOURCES PLANNING**

10.1 Considering the heavy economic loss due to delay in implementation of projects, all clearances, including environmental and investment clearances, be made time bound.

10.2 Concurrent monitoring at project, state and the central level would be undertaken for timely interventions to avoid time and cost over-runs.

10.3 All components of water resources projects would be planned and executed in a pari-passu manner so that intended benefits start accruing immediately and there is no gap between the potential created and potential utilized.

10.4 Local governing bodies like Panchayats, Municipalities, Corporations, etc., and Water Users Associations, wherever applicable, would be involved in planning of the projects. The unique needs and aspirations of the Scheduled Caste and Scheduled Tribes, women and other weaker sections of the society would be given due consideration.

10.5 All water resources projects, including hydro power projects, would be planned to the extent feasible as multi-purpose projects with provision of storage to derive maximum benefit from available topology and water resources.

## 11. **DATA BASE**

- 11.1 All hydrological data, other than those classified on national security consideration, would be in public domain. However, a periodic review for further declassification of data may be carried out. A State Water Informatics Center would be established to collect, collate and process hydrologic data regularly from all over the State, conduct the preliminary processing, and maintained in an open and transparent manner on a GIS platform.
- 11.2 In view of the likely climate change, much more data about snow and glaciers, evaporation, tidal hydrology and hydraulics, river geometry changes, erosion, sedimentation, etc. needs to be collected. A programme of such data collection would be developed and implemented.
- 11.3 All water related data, like rainfall, snowfall, geo-morphological, climatic, geological, surface water, ground water, water quality, ecological, water extraction and use, irrigated area, glaciers, etc., would be integrated with well defined procedures and formats to ensure online updation and transfer of data to facilitate development of a strong database for informed decision making in the management of water.
- 11.4 Detailed exercises shall be carried out on a period basis to assess the requirement for various uses, availability of water resources to service these diverse uses in a prioritized manner, and spell out approaches and strategies to achieve the desired outcomes.
- 11.5 Basin/ Sub-Basin wise availability of water in the rivers/ nallahs shall be prepared in a scientific manner so as to have a credible database which shall be used to ensure proper planning and development of water resources. While doing so, the latest

technologies as prevalent in the field of assessment of water resources, snow and lake hydrology, ground water hydrology and recharge, water harvesting, evaporation and seepage losses, economic design for water resources projects, crops and cropping systems, safety and longevity of water related structures, soil and material research, better water management practices, use of remote sensing technology in the development and management, shall be adopted.

- 11.6 The limits of usage in accordance with the requirement of meeting the obligations of the State under any treaty, bilateral agreement or statutory obligation shall be clearly spelt out from time to time for guidance of the uses and planners.

## 12 **ALLOCATION PRIORITIES**

- 12.1 In terms of Section 4 (1)(v) of the J&K State Water Resources (Regulation & Management) Act, 2010, water allocation priorities would be as under:

- i) Drinking Water including washing and bathing;
- ii) Irrigation;
- iii) Generation of electricity;
- iv) Ecology; and
- v) Agro industries and non agricultural industries.

## 13 **FLOOD MANAGEMENT**

- 13.1 The history of J&K is rife with frequent floods which have often led to inundation of villages; and large scale destruction of agricultural crops and consequent famines. The flood in the state are mainly

caused due to heavy rainfall in the higher catchments, rapid glacial-melt and snow-melt coupled with cloudbursts.

- 13.2 Before the recent floods of September 2014, the State has witnessed major floods in the years 1900, 1902, 1903, 1905, 1912, 1929, 1948, 1950, 1955, 1957 and 1959. Floods were also witnessed in the years 1976, 1987, 1988, 1992, 1993, 1995, 1997 and in September 2006. The floods of September 2014, the biggest of those that have ever hit the State of Jammu and Kashmir, have caused immense damage resulting in loss of land, lives, houses, public infrastructure, and business hubs etc.
- 13.3 Detailed guidelines shall be notified for preparation of a master plan for flood prone areas with a view to indicating the measures to control the floods and providing protection against the floods. Measures to establish the extensive networks for flood forecasting to give timely warnings to the people likely to be effected shall also be outlined. A roadmap for determination of the limits of the flood basins and the necessary exercises to be carried out shall be prepared. Suitable cost effective measures to minimize land erosion shall be identified and actively promoted.
- 13.4 Further, measures shall be taken to protect the natural drainage systems with a view to removing artificial barriers in the path of flow of excess drainage water. Operating procedures for reservoirs shall be evolved, and implemented in such a manner so as to have flood cushion, and reduce trapping of sediments during flood seasons.

## 14. **GROUND WATER**

14.1 The J&K State has 332559.23 million hectares Meter/ Annum of available Ground Water Resources out of which only 22% has been developed so far. Due to the less development of ground water, the State is in Safe Zone and none of the districts are in critical/ overexploited category.

14.2 Notwithstanding the above position, it is considered absolutely imperative to devise measures for assessing Ground Water status on a regular basis, besides laying emphasis on the registration of all wells being sunk for ground water exploitation. Even though the state is in safe zone, it needs to identify measures aimed at ground water recharge by maximizing retention and minimizing loss of water. This can be achieved through an integrated water shed management programme involving extensive soil conservation measures, catchment area treatment, preservation of forests and wet lands, increasing the forest cover, construction of check dams and other ground water recharge measures. Other non conventional measures such as artificial recharge of ground water and traditional water conservation practices like rain water harvesting including promotion of roof top rain water harvesting shall be proactively promoted. Also, various measures for encouraging recycling and reuse of water shall be identified and implemented. Various important stake holders like Integrated Water Management Programme of Rural Development Department, Soil Conservation Directorate of the Forest Department and PHE/ I&FC Department shall be encouraged to integrate their requirements and dovetail their resources for achieving the sustainability of the water resources in kandi areas in particular,



and the State in general. Further, as provided in Chapter-VII of the Act, the concerned agencies shall be enjoined upon to keep a close watch on the status of ground water in different parts of the State and refer cases to the Authority for regulating its extraction and notifying any area under stress as per Section 111 of the Act.

## 15. **DRINKING WATER**

15.1 Providing of safe drinking water is broadly categorized into two different categories viz Urban Drinking Water Supply and Rural Drinking Water Supply.

15.1.1 **Urban Drinking Water:** The J&K State has two major cities viz Srinagar and Jammu with a combined population of 26.12 lacs (including floating population). As per the CPHEEO norms, drinking water is to be supplied @ 135 liters per capita per day (LPCD) and the requirement of drinking water works out to 116.22 MGD (Million Gallons per Day) against which total operational capacity of 104.36 MGD has been created, thereby leaving a deficit of 11.86 MGD as on date.

15.1.2 **Other Towns:** The urban population in towns of the state is of the order of 14.48 lacs souls which require 74.80 MGD against which present installed capacity is 33.78 MGD leaving a deficit of 41.02 MGD.

## 15.2 **Rural Water Supply System**

15.2.1 The J&K State has a rural population of 91.08 lac souls and the total requirement of water works out to 147.72 MGD @ 40 LPCD. The present installed capacity is 92.13 MGD thereby leaving a deficit of 55.59 MGD.

### **15.3 Perspective Plan**

15.3.1 A perspective plan to meet the above requirements shall be prepared and steps taken to provide adequate resources for this purpose in a phased manner both from central and state sources, and by raising funds from various quarters. Efforts shall be made to make the water supplies self-sustaining, at least to meet O&M costs, as far as possible, considering the socio-economic conditions of the population to be served.

### **15.4 Promotion of Water Conservation**

15.4.1 Various measures for the promotion of water conservation consciousness through education, awareness building regulating, incentives and disincentives as well taking various steps to promote water conservation as recommended by J&K State Water Resources Regulatory Authority vide its communication No. JKSWRRA/T-28/752/2014 dated 10.01.2014 shall be adopted and implemented.

## **16 PRESERVATION OF TRADITIONAL WATER RESOURCES**

16.1 The State has; especially in kandi areas of Jammu, a large number of traditional water harvesting ponds which are presently suffering neglect. A few initiatives taken to improve the upkeep of these ponds have shown good results. It is considered absolutely important to give priority importance to this issue, as these ponds can serve the village communities for meeting their drinking water and other needs; especially during the periods of distress and temporary failures of water supply schemes from time to time. These can also be used to stock fish and thus become productive economic assets

for local village panchayats/communities. An Action Plan shall be prepared to meet this challenge.

## 17. **IRRIGATION**

17.1 While realising that substantial development has been done in this sector during successive five year plans, an assessment of the present status of irrigation vis-à-vis the resource availability and requirement, it is felt that a lot more needs to be done. A two pronged strategy in respect of viz (i) exploitation of unutilised resources and (ii) qualitative improvement in the management of already harnessed resources, is called for.

17.2 The following actions shall be taken for ensuring more optimum exploitation of unutilised resources:

17.2.1 Preparation of perspective plan upto 2025, both in respect of surface and underground water. The implementation schedule would ensure continuity in the process so that funds, expertise, equipment and trained manpower is evenly deployed yielding optimal results.

17.2.2 The water resources projects, specially multipurpose projects are generally capital intensive having long gestation periods, therefore, long term investment decisions in accordance with the perspective plan need to be taken so that the projects are completed on schedule.

17.2.3 The projects need to be self sustaining. Presently, the benefit cost ration is determined on the basis of indirect benefit that accrue to the state and not directly to the project. Therefore, the concept of self sustainability needs to be defined. Since irrigation is as essential input for agriculture, the pricing of water has wider economic ramifications.

17.3 In order to realise fuller benefits from the investments made in irrigation sector, efficient management, scientifically economical use and conservation of harnessed water is imperative. The present status has a substantial scope for qualitative improvement in this field. In this regard, the following actions need to be taken:

17.3.1 The vast irrigation system of the state, some of which are more than 150 years old, are in dire need of restoration and rehabilitation. Modernisation and updation of these channels is also needed to cater for future requirements.

17.3.2 “Conveyance Management” needs to be improved specially because most of the system are fed by run-of the river schemes. These systems would be provided with mechanism using appropriate technology top enable quick adjustments of supplies as per requirements dictated by water availability and the priorities at the field. In addition, the following aspects needs to be specially considered:

17.3.2.1.1 Adequate and appropriate M.I.S. to ensure the running of system for optimal use as per availability and priorities of requirement.

17.3.2.1.2 Reduction in losses need to be ensured by inter-alia adopting the following measures:

- Judicious use of lining of canals
- Checking unauthorised use of cutting of canals and other means

17.3.3 “Field Management” needs to be tackled on high priority to achieve most efficient use of water at the field level wherein equity in its dispensation and proper recovery of dues is ensured. The following aspects need to be considered:-

17.3.3.1.1 A thrust needs to be given to improvement of command areas (such as levelling of fields improvement and maintenance of water courses etc).

17.3.3.1.2 Adoption of improved irrigation and agriculture practices using appropriate technology to ensure optimal use of water for agriculture production. This would also aim at adoption of appropriate cropping pattern suitable for the area in question.

17.3.3.1.3 The needs of small and marginal farmers shall be given special consideration while managing irrigation water.

## 18. **HYDRO POWER**

18.1 The state hydro potential has been assessed as 20000 mw against which about 2456.20 mw has been harnessed so far. The state has been perennially short of Power. Apart from shortfall in total energy requirements, the shortage of peak power is more acute.

18.2 In hydel sector efforts shall be made to accelerate the process of constructing new projects so that the available water resources are put to optimal use (specially by taking up multipurpose projects).

18.3 In order to meet the present and future requirements, the allocation of water resources shall accommodate these requirements so that power development does not suffer on this account.

## 19. **INSTITUTIONAL ARRANGEMENTS**

19.1 J&K State Water Resources Regulatory Authority already stands established since October 2012 and is functioning. It has been assigned the following main functions:

(1) The Authority shall discharge the following functions, namely,-

- (a) determine the entitlement and distribution for various categories of use of water within each category and the terms and conditions of distribution or allocation ;
- (b) enforce the decisions and orders issued under the Act;
- (c) fix the priority for equitable distribution of water available at the resource, project, sub-basin and river basin levels during periods of scarcity;
- (d) establish a water tariff system and fix the water usage charges for use of water on account of -
  - (i) drinking purposes (domestic, commercial and industrial);
  - (ii) irrigation of land;
  - (iii) exploitation and use of ground water; and
  - (iv) generation of electricity:

Provided that water usage charges shall at least recover the cost of the project and the expenditure incurred on its operation, maintenance and management.

- (e) regulate use of water by the users and licensees from all water sources in the State;
- (f) adjudicate upon the disputes between the licensees and the department;
- (g) specify or enforce standards with respect to quality, continuity and reliability of service by the department and the licensees;
- (h) ensure satisfactory service on the part of the concerned department or agency to the users or licensees;
- (i) ensure transparency while exercising the powers and discharging its functions;
- (j) advise the Government in the promotion of competition for the optimum utilization of water resources in the State;
- (k) administer and manage inter-State water resources apportionment on river systems of the State;

- (l) approve and review water resources schemes and projects:

Provided that before approving any scheme or project, the Authority shall ensure that the proposed scheme or project is in conformity with-

- (i) the integrated State Water Policy and plan;
- (ii) the economic, hydrologic and environmental viability; and
- (iii) the obligations of the State under any agreement, or decree or judgment of a court or tribunal, or inter-State water entitlement:

Provided further that while approving any new water resources scheme or project, instructions issued by the Government from time to time relating to investment priority are strictly observed;

- (m) establish a system of enforcement, monitoring and measurement of the use of water both in quantity and type of use;
  - (n) establish a regulatory system for the water resources of the State including surface and subsurface waters, to regulate the use of water and apportion the entitlement to the use of the water between water using categories;
  - (o) promote efficient use of water and to minimize the wastage of water; and
  - (p) discharge such other function as may be prescribed or assigned to it by the Government.
- (2) The Authority may review and revise the water usage charges fixed by it under clause (d) of sub-section (1) after every three years.
- (3) In the event of water scarcity, the Authority, may re-fix the entitlements and adjust the quantities of water available to all users and licensees in such manner as the Authority may deem necessary to overcome such scarcity and to ensure equitable distribution of available water.

- (4) The Authority shall, in accordance with the State Water Policy, coordinate with all concerned agencies to implement a comprehensive hydro-meteorological data system for the state.
- (5) The Authority shall, promote and implement sound water conservation and management practices throughout the State.
- (6) The Authority shall support and aid the enhancement and preservation of water within the State in close coordination with the other States.
- (7) The Authority shall ensure that while approving the water schemes and projects, the principle of 'tail to head' irrigation is implemented.
- (8) The Authority shall strive to make the water available to the drought prone areas of the State.

19.2 As shall be seen, the Authority has a very extensive mandate, and it would be further strengthened with a view to enabling it to discharge its functions more effectively.

19.3 As laid down in Section 12 of National Water Policy, and subsection (r) of Section 4 of the J&K State Water Resources (Regulation & Management) Act, 2010, appropriate institutional arrangements shall be made for each river basin to collect and collate all data with a multi sectoral and multi-disciplinary approach on a regular basis.

19.4 Institution arrangements are also required to be in place wherein the data from the various stake holders (Private/government/semi government) is made mandatory to be made available to the I&FC Department, as far as their individual requirements are concerned.

19.5 It shall be necessary to identify apex bodies to enable proper coordination in the planning of various projects and to identify as to which projects can be taken up as multipurpose projects. These apex bodies would be empowered to assess ecological and



environmental concerns and suggest measures for meeting the challenges of ensuring environmental sustainability, resettlement and rehabilitation of project affected people.

19.6 The State will strive to create a single point mechanism for effective coordination among various Departments, organizations & stakeholders.

## **20 USE OF SCIENTIFIC & INNOVATIVE TECHNIQUES FOR PREVENTION & REDUCTION OF POLLUTION OF SURFACE & GROUND WATER SOURCES & IMPROVE THE QUALITY OF WATER**

20.1 It shall be ensured that every project includes measures for prevention and reduction of pollution of water, and improvement of quality of water. Water quality testing laboratories would invariably be an integral part of major new schemes, besides establishing a network of water quality testing laboratories at appropriate levels to ensure regular testing and monitoring of water quality, with reference to the parameters laid down by the Government of India and the J&K State Water Resources Regulatory Authority.

## **21 RESETTLEMENT AND REHABILITATION**

21.1 The study of the impact of project, during construction and afterwards, on human lives, settlements, occupations, economic and other aspects would be an essential component of water resource planning. Rehabilitation and resettlement of affected persons and other measures needed as a result of the study would be taken up on a priority basis along with the project itself. Since this is an aspect which affects all kinds of development activities

and has wide ramifications, a multidisciplinary task force would be constituted to lay down general principles and also assist in formulating individual projects.

## **22. DROUGHT MANAGEMENT**

22.1 Drought prone areas would be made less vulnerable to drought associated problems through soil moisture conservation measures, water harvesting practices, minimization of evaporation losses, development of ground water potential including recharging and transfer of surface water from surplus areas, where feasible, and appropriate. Pastures, forestry or other modes of development with relatively less water demand would be encouraged. In planning water resource development projects, the needs of drought prone areas would be given priority.

22.2 Relief works undertaken for providing employment to drought stricken populations would preferably be utilized for drought proofing.

## **23. TRAINING**

23.1 A perspective plan for standardized training would be an integral part of water resources development. It would cover training in information systems, sectoral planning, project planning and formulation, project management, operation of projects and their physical structures and systems, and management of the water distribution systems. The training would extend to all the categories of personnel involved in these activities as also the farmers.

## 24. **OTHER IMPORTANT ISSUES/MATTERS**

24.1 In addition to the above, the following important issues/ matter shall be addressed:

- i. promotion of suitable cost effective measures to minimize the erosion of land by streams;
- ii. encouragement of measures like soil moisture conservation, water harvesting, works aimed at increasing the ground water potential by recharging and transfer of surface water from the surplus areas for reducing the problems and severeness related to drought ;
- iii. development of grazing fields and encouragement of afforestation to improve drought management ;
- iv. setting up of a proper organisational arrangement at the State level consisting of specialists in investigation, design, construction, hydrology, geology etc. for ensuring safety of storage dams and other water related structures;
- v. monitoring of water resource projects to identify bottlenecks and to adopt timely remedial measures ;
- vi. evolution of a system for evaluating the socio economic and environmental impact of projects ;
- vii. periodical audit of the working systems to check the sustainable losses taking place between storage, distribution and usage points;
- viii. encouragement of research particularly in the fields of hydro-meteorology, assessment of water resources, snow and lake hydrology, ground water hydrology and recharge, water-harvesting, evaporation and seepage losses, economic designs for water resources projects, crops and cropping systems, sedimentation of reservoirs, safety and

longevity of water-related structures, river morphology and hydraulics, soils and material research, better water management practices and improvements in operational technology, recycling and re-use, seismology and seismic design of structures and the use of remote sensing technology in development and management.