# Nagaland Water Policy, 2016

# NAGALAND WATER POLICY-2016

FINAL VERSION

SUBMITTED BY

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# NAGALAND WATER POLICY (2016)

## 1. PREAMBLE

1.1 Water is a prime natural resource and fundamental to life on Earth. Water is also invaluable and scarce national resource in the context of growing scarcity of fresh water resources in the country. In Nagaland, water is a critical natural asset as it is fundamental to ensuring food security, integrity and health of ecosystems, maintenance of ecosystem services, religious and cultural life of Naga people. It will continue to play a decisive and multifaceted role in the developmental planning of the state. In order to lead the state of Nagaland on to sustainable developmental pathways it is necessary to initiate measures for ensuring economic, judicious and equitable use of water resources in the state. Owing to the unique hydrological, social and legal context of Nagaland, a state specific water policy is necessitated which is responsive to its existing and future needs encompassing a long-term water resource management program.

## 2. OVERVIEW OF WATER RESOURCES OF THE STATE

### 2.1 Rainfall

The state receives an average annual rainfall of 1715 mm. Eighty percent of the rainfall is received during the pre-monsoons and monsoons. The heavy rains during the monsoons, coupled with the hilly topography of the state leads to high surface runoff.

### 2.2 Surface Water

The predominant sources of water in Nagaland are surface water in rivers, streams, ponds and natural springs and subsurface water occurring as ground water. Nagaland has four main rivers, namely, Doyang, Dhansiri, Dhiku and Tizu. Of these, the first three flows towards west through Assam plains to join the mighty Brahmaputra, while Tizu river system flows towards the east and southeast and pours into the Irrawaddy in Myanmar. The Barak River also drains a small area, in Peren district, of Nagaland. The catchment area of Brahmaputra Basin in the state is 10,881 sq. km, which is 65.6% of the total geographical area leading to a total water yield of 14282 MCM. The catchment area of Barak Basin is 814 sq. km, which is around 4.9 % of the total area and has water yield of 738 MCM. The catchment area of Tizu Basin covers 4884 sq.km, which is 29.5% of the total area and has water yield of 4463 MCM.

### 2.3 Groundwater

Geologically the State is covered by rocks ranging in age from Pre-Cretaceous to Recent. The rock sequence comprises the geosynclinals facies, represented by the Disang Group, Barail Group, Surma Group, Tipam Group, Namsang Formation and the Dihing Group. Hydro-geologically, two distinct groups of rocks i.e. semi consolidated and valley fill deposits underlie the state where ground water occurs under water table to confined conditions. The water-bearing formations are identified as unconsolidated alluvial deposits, Upper Tertiary formations of Dihing and Tipam Groups and fractured zones of semi-consolidated & consolidated formations. Groundwater occurs both under water table and semi-confined to confined conditions. The major part of the State is covered by hilly terrains having more than 20% slope comprising of semi-consolidated/consolidated rocks and act primarily as run-off zone. The ground water resource potential of the State has been computed as 0.36 BCM as on 2009. For domestic utilisation, most of the populations depend upon spring water and the ground water draft for domestic use as such is meagre viz. 0.008 BCM. The water level varies from 1.4 meters to 16.4 meters bgl in valley areas and 2.2 meters to 54.5 meters bgl in hilly terrain.

## 3. EMERGING CONCERNS AND CHALLENGES

The present scenario of water resources and their fragmented management through a variety of institutions at the state level with overlapping mandates has given rise to several water related concerns and challenges that need immediate attention, most significant are as follows:-

(i) Villages in Nagaland are located at the hilltops and their population has been increasing since their establishment. Once sufficient, the existing locally available water resources are unable to meet existing water demand in the villages for drinking and sanitation purposes. Additional sources of water supply in the villages therefore need to be augmented.

(ii) The existing system of community water storage structure in the villages aimed at meeting domestic water requirements of the inhabitants need improvement for ensuring water quality, whereas quantity of water needs to be seen in the context of increasing potable water use in the villages.

(iii) After the formation of state of Nagaland, water resource development has not received required attention and priority resulting in fragmented institutional framework and skewed water governance.

(iv) Due to a wide temporal and spatial variation in availability of water, likely to exacerbate due to a number of variable factors including climate change impacts resulting in incidences of water related disasters such as loss of soil fertility, flash floods and river meandering, the water crisis in the state is likely to deepen.

(v) Access to water for drinking and other domestic needs is an emerging challenge in many urban areas, towns and villages in the state. The potential for inter-village water transfer with the payment for ecosystem services mechanism needs exploration.

(vi) The scenario of groundwater in Nagaland is rather oblique. Groundwater being part of hydrological cycle is sufficiently not addressed in the water resource planning in the state whereas instances of groundwater exploitation are increasing with an alarming rate.

(vii) Development of water resources through multi-disciplinary approach involving all stakeholders through their local customary institutions for optimum utilization of available water resources, ensuring integrity of ecosystems and leading to the development of progressive regime on ecosystem services has not received adequate policy consideration in the past. The development of water resources projects in Nagaland needs to be done within the framework of community participation by involving village level institutions.

(viii) Development of irrigation infrastructure is critical to ensuring food sustainability in the state.

(ix) Natural water bodies, streams and springs that form core of natural water infrastructure in the state are being increasingly polluted. Springs that are the main source of drinking water supply are however protected by traditional institutional regime at the village level, which needs to be further strengthened with scientific inputs.

(x) However, communities value water as per customs and sanctions, consciousness pertaining to existing water stress that is likely to result in water scarcity needs to be created at the Village Council level.

(xi) Scientific capacity building of institutions for the integrated water resource management in the state needs to be undertaken on an urgent basis.

(xii) Spring and stream mapping and characteristic of catchment areas, recharge zones and flood plains needs to be better understood towards planning for any likely change caused due to climatic variations and incidents of natural disasters.

## 4. OBJECTIVES

The overall objective of the Nagaland Water Policy is to create an integrated vision, policy and institutional framework. The framework that takes cognizance of existing water scenario in the state to outline policy initiatives and interventions as well as a plan of action that would aim at improving water resource planning and management in the state. In view of the concerns highlighted herein above, the

following broad water resources development and management objectives are conceived:

(i) To ensure conservation, protection, safeguard restoration and rejuvenation of water resources in the state of Nagaland to optimize their utilization.

(ii) To ensure fulfilment of basic right to water of present and future generations.

(iii) To launch a statewide campaign to spread "*conservation consciousness*" and water sensitization through education, regulation, incentives and disincentives.

(iv) Adoption of an integrated and multi-disciplinary approach to planning and implementation of water resources projects within the framework of community participatory eco-development model by involving traditional village institutions.

(v) Development of all utilizable water resources including surface water, sub-surface water, groundwater and wastewater, to the maximum possible extent for food security, economic development and social well-being.

(vi) Equitable and judicious allocation of all utilizable water resources with drinking water and domestic water use as the first priority.

(vii) Maintenance of water quality at prevailing standards and reduction of water resources' pollution by urban sewage and industrial effluents.

(viii) Mainstream basin and sub-basin level planning by notifying river basins and involving traditional and customary institutions in this process.

(ix) Development of institutional capacity for promoting optimization and conjunctive use of available surface and ground water in the state through training and education. Creating scientific capacity for water and land use planning at the Village Council level including Village Land Use Committee.

(x) Encouraging efforts to create infrastructure for water supplies in urban and rural areas and raise the level of reliability of water supplies by water resource exploitation.

(xi) Development of robust infrastructure for flood protection, flood plain zoning, prevention of soil erosion and to mitigate and deal with impacts of river meandering. Use of existing traditional

knowledge coupled with scientific inputs and assessment in the resource conservation and catchment area treatment. Promoting participatory water resource developmental planning with Village Councils as the nodal agencies for the joint planning, management and implementation of water related schemes and projects. Progressively, promoting formation of Water User Associations (WUA) intended to manage water supplies for irrigation, physically and financially.

(xii) Encouraging water conservation and management through appropriate and socially acceptable water tariff towards promoting the goal of water use efficiency.

(xiii) Encouraging and facilitating private sector initiatives in the planning, development, operation and management of water resources projects with prior informed consultative process with village council, government and stakeholder agencies.

(xiv) To provide for a conflict resolution mechanisms in consonance with the traditional justice dispensation mechanism between water users.

## 5. GENERAL PRINCIPLES

The Nagaland Water Policy needs to be governed by certain general principles, and in conformity with the principles enshrined in the National Water Policy, 2012, to ensure uniform approach in developing water resources management planning and projects by the institutions involved at the state level, basin level and village level. The state of Nagaland will be guided, in achieving the objectives of the state water policy by the following general principles:

1) *Recognising Fundamental Right to water for drinking, sanitation and domestic use*: The policy explicitly recognizes the fundamental right to water for drinking, sanitation and domestic use of all inhabitants of the state irrespective of their tribe, creed, gender and nationality in conformity with prevailing Naga traditions and customs. The state government, under the doctrine of Public Trust, despite community management and control of water resources, will be obliged to ensure that people's right to water remains unaffected. The State Government shall determine quantity of water required per capita, for ensuring fundamental right to water for drinking, sanitation and domestic. The State Government, in conformity with the national quality standards, will specify and encourage village level institutions entrusted with the management of local water resources to adopt and maintain the quality standards of water supply specified for different uses, such as drinking, other domestic uses, livestock, irrigation, industries, etc., and will ensure that these standards are fully complied with.

2) *Principle of equity and social justice, equitable and sustainable utilization* to inform allocation of all utilizable water for competing uses in urban and rural areas. Drinking water to be given priority amongst all other uses of water.

3) *Joint Public Trusteeship of Water Resources*: All water resources (surface and ground) in the state shall be held in public trust jointly by the people and the state through institutions recognized and established at the village level under existing and future legal frameworks. The public trust doctrine shall empower the village councils as well as the state government entrusted with the duty to carry out the policy imperatives and to impose reasonable restrictions on access and usage of water resources as may be necessary for the sustainable and integrated management of water resources in the state.

4) *Recognition of Community Right to water resources*: The Policy recognises the existing right of the community to protect, regenerate, conserve or manage any community water resource which a community has traditionally been accessing, protecting and conserving for sustainable use. This recognition enjoins upon every resident of the state duty to protect, conserve and manage water and water resources in conformity with the principles enunciated herein.

5) *Integrated Planning:* Water resources in Nagaland are to be managed with common integrated perspective evolved through consultations and participatory methods, considering local and state context, on a sound ecosystems approach, keeping in view the human, social and economic needs.

6) *Village ecosystems Governance*: The village level institutions should lead by example by initiating village level water resource planning in an integrated manner for undertaking measures pertaining to water conservation, development and management taking into account surface, ground and wastewater in an integral manner as per village, and ecological needs. The village level institutions must integrate in their water plans all the measures necessary to protect the ecological integrity necessary to sustain ecosystems dependent on water.

7) *Transparency, accountability and good governance:* The Village level institutions should carry out its business in a manner that is transparent, accountable and participatory.

8) *Coherent framework for water and land use planning:* Land and land use in Nagaland forms the very basis of life of Nagas. Water management related decisions to be taken with due regard to the land use planning and appropriate land use shall be encouraged with due regard to the availability of water as per the local needs.

9) *Restoration and rejuvenation of water ecosystems:* Water resources in Nagaland, due to unplanned developmental activities have been affected leading to drying up of springs and streams. The appropriate agencies should undertake efforts to restore and rejuvenate such critical water ecosystems in their natural state.

10) *Protecting River Basins and Sub-basins:* A slew of measures would be implemented to ensure afforestation and soil conservation in the catchment areas to secure water sources. Prevention of soil erosion into river system is necessary to prevent contamination of water through mixing of bio-fertilizers and bio-pesticides. Treatment of sewage before its discharge into streams and river systems shall be undertaken by the appropriate agency. Direct discharge of sewage into rivers, streams and other water bodies shall be prohibited.

## 6. POLICY INITIATIVES

6.1 Definitions: For the Water policy, unless the context otherwise requires

(a) "Conservation" includes but is not limited to reduction in wastage or losses, improved efficiency, recycling, reuse, preservation, protection and water demand management;
(b) "Policy" means the Nagaland Water Policy, 2016;
(c) "Public Trust" is the authority bestowed upon the state and village level institution recognized under this Act, to hold natural resources as a trustee on behalf of the public and such authority shall run concurrent with private/community ownership rights;
(d) "River Basin" means the area of land around a river from which streams run down into it and notified by the state government;
(e) "Tribal Council" means and includes Tribal Council recognised under Nagaland Village and Tribal Council Act, 1978;
(f) "Village Level Institution" means and includes village council and village development board duly recognised and constituted under Nagaland Village and Tribal Council Act, 1978;
(g) "Water Resource" includes all surface, sub-surface, ground water, spring, drainages and aquifers having their source of origin within the state or passing through the state.
(h) "Water User Association" means a legal entity at the village level which represent the users of irrigation water, ground water or drinking water;

**6.2 Six Pronged Strategy:** In order to address the concerns, challenges and ensure water security, future welfare and rights of future generations, the Nagaland Water Policy will be based on Six Pronged Strategy. **First,** the State is committed to give a broad and uniform policy direction to all state water resource management institutions for creating enabling environment and institutional vision for achieving the policy objectives, notably equitable and sustainable water resource management. **Second,** through this Policy, the state aims to restructure the fundamental roles and relationship between institutions involved in water resources management to improve their coordination and harmonize their operations. The restructuring is also aimed at strengthening and empowering local as well as state level institutions towards achieving their full

participation in the water resources management. **Third,** the state, with the objective to ensure basin level planning, will create new institutional structure at the basin level or rework the existing institutional arrangements to create basin level institutional regime that will coordinate with village level institutions on integrated water management. **Fourth**, the State will place high priority on enhancing scientific and personnel capacity of water sector institutions to promote scientific planning, adaptation measures and organized ground level implementation. **Fifth,** the State will ensure that water and land use planning is synergized as in the unique agricultural context of Nagaland the two are inter-dependent. Hence, any capacity development in water resource planning has to take view of capacity enhancement for land use planning as a necessary measure. **Sixth,** most importantly, the State will enact a comprehensive state water law (Acts, Rules and Regulations) and enabling rules to give effect to the above-mentioned strategies in a time bound manner. The intended water legislation will aim at complementing the role of Village Councils in managing land and water resources in the state

**6.3 Drinking water and water for domestic use:** Adequate drinking and domestic water as per prevailing norms shall be provided to the entire population both in urban and rural areas to meet its domestic water requirement. Multipurpose projects wherever planned and implemented must take into account domestic water needs where there are no alternative locally available sources for meeting domestic water needs. Efforts should be made to make water supply self-sustaining by providing mechanisms for operation and maintenance costs.

Allocation of water would be made as per the priority of use on a per capita basis. The scientific basis for water allocation would be applied to determine existing water requirements in the light of total availability of water resources and facilitate water planning for future.

**6.4 Water Quality:** The quality of water resources of the state is protected to ensure their usability and sustainability. The prime responsibility to protect local water resources and their quality is of the people of Nagaland. The Nagaland State Pollution Control Board to undertake an effective program, in consultation with village level institution and state agencies, for control of discharge of any pollutants in the surface and sub-surface water resources. The river basin management plan to incorporate a pollution-monitoring plan. Pollution of water resources is prohibited under the Water (Prevention and Control of Pollution) Act, 1972. Those found polluting should be punished as per law by relevant state level regulatory agency. The principle of "Polluters must pay" will be applied to meet the expenses of maintaining water quality. Both surface water and Ground water should be regularly monitored for quality. Top priority will be given to address water quality problems.

**6.5 Priority of water usage and allocation principles thereof**: Water in Nagaland shall be allocated as per the following priority of usages:

i. Water for drinking, sanitation and domestic use

ii. Irrigation, Agriculture and sustainable livelihoods such as livestock, fisheries etc
iii. Water for ecology, environment and sustainability of water based ecosystems, wetlands and aquatic life
iv. Agro based and rural industries
v. Hydropower, industry, commercial and municipal uses, including thermal power plants
vi. Recreational, tourism and navigational uses
vii. All other uses

Priorities can be modified or added if warranted by local area specificities. The state government to notify the nodal agency for permitting different uses of water resources.

**6.6 Integrated, multi-sectoral and basin level approach for maximizing water usability:** River basin and sub-basins will be considered as the basic hydrological unit for integrated water resource management in the state. The state will adopt a multi-sectoral participatory approach for integrated water resource management at all levels of governance conjunctively for surface and ground water, taking into account quantity, quality and environmental considerations. The management of water resources shall be decentralized to the lowest possible level through Village Councils, on the basis of hydrologic or watershed unit. Basin management institutions maybe established by the State Government by enacting suitable legislation. A comprehensive integrated river basin management plan would be prepared in consultation with the Village Councils. The River Basin Management Plan would be a strategic planning document and an operational guide to implement programmes and measures that will form the basis for integrated, environmentally and economically sound and sustainable water management. The integrated approach will include catchment area treatment and management, conservation, ecosystems approach and development of progressive regime for the payment of ecosystem services.

The river Basin management plan would form the background for assessing future water resources projects in the state. This multi-sectoral and multifunctional approach would complement the State Government's efforts towards food security, increased agricultural productivity and incomes, reduced vulnerability arising from incidences of natural calamities.

**6.7 A bottom-up State Water Plan:** Based on the integrated River Basin Management plans the State Government shall formulate a State Level Water Plan. The State Level Water Plan will take into account the needs and requirement of all stakeholders and give a unified direction to the structural measures, project initiatives, operational measures, watershed management measures and monitoring measures.

**6.8 Irrigation Management and development**:

Nagaland is an agrarian society with agriculture as the mainstay of economic activity. In the plains, permanent irrigated farming is limited. Hence, it is imperative to develop available areas in the intermittent valleys and cultivable slopes in the hills with emphasis on micro-irrigation system.

The rivers of the state are dependent upon rainfall. The effect of climate change is felt more acutely in the fragile environment of the hilly region and the flow of perennial rivers and streams is becoming reduced during the lean season to the extent of drying up.

Hence, the full irrigation potential needs to be developed through irrigated planning for assured as well as protective irrigation towards sustainable irrigation activity. In the irrigation development programs, the farmers shall be involved in planning and implementation, operation and maintenance through the Water Users Association (WUA) for efficient and judicious use of water.

**6.9 Role of Jhumias (shifting cultivators) in the management and conservation of moisture/fallow management:** In line with the land use planning and fallow management strategies to be undertaken in the state wherein orchard and other commercial crops, requiring water supply, will be promoted. Jhumias through their Village Councils should actively participate in identifying water needs during the fallow period based upon fallow interventions made on the Jhum plot. Such water needs should be accounted for and incorporated in the river basin management plan.

**6.10 Private sector participation in the water sector:** The State shall encourage private sector participation in financing and implementing water projects. However, any involvement of the private sector in any area or river basin shall be done in consultation with various stakeholders involved in water management including Village Councils...

**6.11 Water data, monitoring and information system:** data and information is the key for effective management of water resources. A modern and integrated network of hydro-meteorological and related water use data shall be established. State level agencies shall be trained for collecting and maintaining data who in turn will also build capacity at the local level for strengthening data collection and information management system. The water data in Nagaland shall be made available in public domain.

**6.12 Water Audit:** Currently, the potential for harnessing all utilizable water resources in Nagaland is limited. There is also limited number of water supply schemes operating in the state. However, water audit is a useful tool to understand the use of water and potential for its increased utilization. The government shall encourage water audit, especially of water resources projects and schemes in the urban areas to keep an account of various uses of water.

**6.13 Demand Side Management (DSM) and Water Use Efficiency (WUE):** DSM is the key to the future of water security in the state of Nagaland. Efficiency of utilization in diverse uses of water, particularly agricultural uses need to be improved. DSM in the domestic sector requires significant reforms due to the scanty supply of water and poor water infrastructure. Firstly, efforts need to be made to fulfil the domestic water demand by improving water supply infrastructure in urban and rural areas. The infrastructure development shall include introduction of water meters and domestic water saving devices at a subsidized cost to all the consumers. Dual piping system, wherever possible, in the new townships should be implemented for collecting sewage and wastewater to be recycled and reused. Progressive water tariff structure and water audit systems need to be put in place after the launch of State Water Policy.

In the agricultural sector, improved irrigation practices aimed at reduction in water losses should be adopted by introduction of suitable technology.

At present, there are no heavy industries in Nagaland. In the light of future developmental potential and plans, especially the commissioning of thermal power plants use of treated and wastewater should be encouraged. . All industries should be charged progressive water tariff and mandatory water recycling should be undertaken by industries.

**6.14 Rivers, springs, wetlands and aquatic ecosystems:** Streams and rivers are the lifeline of Nagaland. All efforts will be made to ensure minimum natural flow in rivers and streams at all times. Allocation of water for ecological needs would be done keeping in mind living needs of aquatic ecosystems. The water requirements of natural systems and human needs dependent on such flow for bathing or cultural activities would, be determined scientifically.

Wetlands and water bodies will be protected involving Village Council and village institutions from encroachments and maintained through scientifically prepared management and action plans.

Water bodies having their origin and passing through Reserve Forest, community conserved areas or protected forest will be protected under the relevant forest and environment legal frameworks.

Spring mapping will be undertaken throughout the state as springs provide for the main source of drinking water and agriculture in the state assessing their health and current number is critical for drinking water security and health in the state.

**6.15 Integrated Watershed Management:** Watershed development projects in Nagaland are being implemented under various schemes and programs. Government of Nagaland would encourage community efforts for watershed development and management projects and would endeavour to mobilize technical and financial support. Specific projects covering areas lacking livelihood options and low food productivity and income will be encouraged.

Topographic and geographic constrains will be kept in mind while facilitating and financing watershed projects. Villages located in difficult terrain and drought prone and inherently water scarce areas requiring financial assistance would be considered on lower levels of cost-benefit analysis.

**6.16 Groundwater regulation and management:** The community and individual right to groundwater, as may be permitted by local customs in different tribes and Naga villages is hereby recognized. Nodal department i.e. Geology and Mining Department will suitably regulate the extraction of groundwater. The Nodal department i.e. Geology and Mining Department would be empowered to regulate and grant permission for extraction of groundwater in areas notified for regulation. The Geology and Mining Department in conjunction with Central Ground water Board would undertake aquifer mapping and advice on areas requiring groundwater regulation. Measures to be taken for groundwater recharge including rain water harvesting and the grant of permission for groundwater extraction would be dependent upon adoption of such measures as may be prescribed from time to time by the Nagaland State Groundwater Authority'.

In non-notified areas, communities will have the right to exploit ground water. The village level institutions in coordination with the state department will inspect, explore and monitor the use of groundwater within the village to ensure its long-term sustainability. The extraction of groundwater can be regulated by village level institutions if it is being over-exploited. The use of groundwater would have to be in conformity with the integrated river basin development plans. The state water law to be enacted will provide for effective regulation and comprehensive regime in this direction.

**6.17 Prevention and control of soil erosion: coherent strategies for water and land use:** Mountain ecosystems in Nagaland are characterized by a range of fragile features resulting into frequent landslide, land erosion, river meandering, riverbank erosion, leading to heavy significant loss in soil and changes in soil configuration. In recent years, soil erosion and loss of productivity has emerged as a major concern in Nagaland that shadows the basic food security and economic well-being of people in the state. No scientific data is available to account for the economic losses and damages caused due to soil erosion and other natural calamities occurred in the state. A long-term land use planning strategy, institutional interventions and community participation is considered to give a more stable direction to address the problem, which also has the potential to reduce poverty and enhance productivity. In this regard, a coherent and synergistic approach for land and water management is the most effective strategy and way forward. Widest possible efforts would be made to employ traditional knowledge and understanding of the terrain features of the areas involving the communities. Preference would be given to biotechnical methods using natural and locally available material.

**6.18 Hydropower:** The government would encourage micro, mini and small hydropower projects, as these projects do not involve storage and their environmental impacts can be mitigated. Developers and investors would be

encouraged to identify sites that involve minimum displacement of villages and communities. Small hydro project would not be restricted to generating electricity alone but would take into account the need to provide assured drinking water and irrigation facilities wherever required.

Large hydropower projects with reservoirs requiring displacement of habitation need to be planned in consultation and effective participation of local communities considering impacts of such projects on water and land resources in Nagaland.

**6.19 Industrial Water Use and Thermal power plants:** Nagaland is not an industrial state but has tremendous potential for the development of agro-industries, which are water intensive. In order to meet future requirements for industrial water use, the allocation of water would be made as per the priority of uses but the state, in effective consultation with communities would be keen to accommodate these requirements so that industrial and economic development is encouraged in Nagaland leading to economic prosperity, creation of sustainable livelihood and socio-economic development.

Location of thermal power plants is critical in the state due to its fragile ecology. As these plants require water for cooling, they need to be located on the riverbanks. At the same time integrity of river ecosystems and their water, flow needs would also be required to be met. Project will be required to make payment for ecosystem services to the communities impacted by intensive use of water for thermal power generation. Thermal power projects would also be encouraged to apply water use efficiency norms and recycle and reuse water in their operations. Only treated and cooled water would be allowed to be discharged by the thermal power plants.

**6.20 Fisheries and aquaculture development:** Creating alternate sustainable livelihoods is one of the flagship programs in the state of Nagaland. The Water Policy aims to strengthen and complement the agenda for creating sustainable livelihoods in the state. Fishery development would be considered an integral part of the water policy measures. Accordingly, fisheries, aquaculture, wetlands, and water bodies temporarily connected with rivers would be encouraged. Capture fisheries to manage natural fish stock by local communities would also be encouraged. Overgrowth of fisheries and their breeding in the closed season will be strictly prohibited. Fishery development in the state will also take into account other biodiversity in the region such as migratory birds and other migratory fish varieties as part of the holistic water and biodiversity management in the state.

**6.21 Minimizing impacts of water resources developmental projects:** The state would give priority to watershed level initiatives and small hydropower development having minimum environmental and social impacts. However, if large-scale projects were planned, utmost care would be taken to carry out a comprehensive environmental, biodiversity and social impact assessment. After a careful assessment of options and alternatives, if resettlement and rehabilitation is required, the communities in the areas would be consulted and no project will be given a head way without prior informed consent of the local communities impacted by the project. The compensation and alternative land or livelihood

options would be determined in active consultation with the impacted communities. The water resource development in the state is to be undertaken in a way that the local communities are benefitted first from such development.

**6.22 Water Zoning:** Economic development and activities including agricultural, industrial and urban development should be planned keeping in mind constraints imposed by water availability compounded by climate change and its effect upon water resources. Delineation of Water zones for the state and the economic activities should be guided and regulated in accordance with such zoning to achieve water use efficiency and judicious utilization of water resources.

**6.23 Sanitation and Sewerage**: The lack of proper sewerage/waste water management systems in the urban and rural areas leads to issues with water quality. Sanitation is through septic tanks (there is still prevalence of open defecation as well) and pit toilets. Even these do not have functional soak-pits. Untreated wastewater is thus allowed to flow into natural water systems such as river, rivulets, streams or springs and the waste water from kitchen is allowed into storm water drains, which in turn flows into the natural water system, leading to pollution of water bodies. Measures such as building community toilets, treatment of sewerage through treatment plants before discharge into rivers, streams to be developed in conjunction with Water Supply and Sanitation Committee (WATSAN) established under Nagaland Communization of Water Supply and Sanitation in Rural Habitation Rules, 2003. The urban areas strategy is to further upscale activities already being undertaken. The key actions for the strategy include, awareness generation, capacity building of institutions, strengthening of a sewerage system and reaching out to uncovered areas, providing public toilets to prevent open defecation, introduction of treatment plants before sewerage discharge into rivers, water bodies.

**6.24 Main Streaming Role Of Women In Water Resource Management And Conservation:** There is an urgent need to recognise role of women in water sector and their active involvement in the management of water projects and conservation of water resources would be ensured. The evolution of institutional and legal frameworks for carrying out purposes of the water policy would ensure participation of women in the decision making process.

**6.25 Water Pricing:** All water tariff/rates/charges would be determined to convey the inherent value of water and to motivate economy in water usage. A system of stepped up water tariff can be evolved to ensure supply of water for meeting basic human needs and at the same time as a measure to ensure water use efficiency. The state government or State Finance Commission would determine water tariffs/charges/rates. The aim is to recover full cost of operation and maintenance and reduce non-revenue water for greater efficiency in operation and maintenance. Differential water tariff/rates/charges may be charged for domestic, industrial, commercial and municipal purposes. The endeavour is to install an effective water metering system in urban areas for water management purpose irrespective of the source and water ownership. It is essential to develop payment for ecosystem services schemes such as its inclusion in water tariff as a watershed and catchment management mechanism to ensure their long-term sustainability. The water

management in urban areas would be governed as per provisions of Nagaland Municipal Act, 2001

**6.26 Catchment Protection:** The protection of catchments of all water sources will be taken up in an expeditious, systematic and scientific manner in order to ensure water security. Catchment Area Treatment, that is, of the water sources, is made mandatory for all the major projects such as hydropower generation, irrigation, urban public water utility services etc. The afforestation and soil conservation measures should be dovetailed with measures for increasing soil retention capacity. The effectiveness of such measures will be monitored and the impact evaluated at designated intervals. The catchment treatment plans, their implementation, their monitoring and evaluation would be undertaken by village level institutions with the full participation of line departments.

**6.27 Conservation of River Corridors and Water Bodies:** In view of the vital importance of water for human sustenance and animal life, water bodies and river corridors in the state would be protected by enacting suitable legislation. Buffer zones should be identified and created along the river corridors as well as catchment areas for preservation and conservation of ecology in an integrated manner in consultation with village level institutions.

**6.28 Flood Control, Drought and Soil Erosion Management:** A flood forecasting system should be established in the rivers of the state. Land use regulation should be integrated with flood plain zoning to propagate compatible land use in flood plains and other flood prone areas. Flood plains should be demarcated for regulation of activities to ensure environmental flows of the river. Flood plain zoning can be undertaken through suitable legislation to prescribe measures in consultation with various stakeholders for management, protection and restoration of flood plains. Flood control and anti erosion measures should be an essential component while planning water resources at a basin, sub-basin and watershed level. The planning for flood management should be done in a holistic manner so that needs during non-flood season is also taken care of.

Special emphasis on drought prone areas and making them less vulnerable by undertaking soil moisture conservation measures to prevent run off, water harvesting practices and promoting traditional water harvesting practice of ‘Zabo’, minimisation of evaporation losses, development of groundwater potential including recharging. Promoting drought resilient crop varieties that are less water intensive. Measures such as agro-forestry can be undertaken to increase soil retention capacity along with land use mapping at the village level.

**6.29 Climate Change Adaptation:** The climate change projections for Nagaland indicate that its likely to be vulnerable in the period 2021-2050s due to heavier precipitation during monsoon, increase in extreme precipitation events, further decrease in precipitation in summer and winter periods, warmer average annual temperatures, and increase in droughts during monsoon, and increase in flood discharge. The strategies

envisaged leading the state towards water security through resource augmentation, efficient use and equitable distribution include implementing basin level management strategies to deal with variability in rainfall and river flows due to climate change. This will include creation of enhanced storage both above and below ground, rainwater harvesting, coupled with equitable and efficient management structures. The village level institutions along with line department need to document geo-hydrology of the villages, map village springs and identify their sources, demarcate the spring recharge zones, and map natural lakes and ponds including the ones that have gone dry.

The incidence of flash floods because of increased precipitation can be managed with installation and improvement of drainage system in towns in plains. This will entail extending drainage where it does not exist and improving drainage systems where it is not fully effective. In infrastructure project it would be made mandatory to include drainage system and setting up water harvesting structures. The list of measures for appropriate drainage can be identified through a study, that takes into account heavier precipitation and increase in extreme events in the climate change scenario. Further, works can be undertaken for stream training emanating from springs, river training and anti-erosion works in identified areas as per the climate change projections.

**6.30 Community management of drinking water supply and sanitation:** In conformity with the Nagaland Communitization of Public Services Act, 2002, the Water and Sanitation Committee (WATSAN) will be further strengthened to manage drinking water supply and sanitation facilities in rural areas.

## 7. IMPLEMENTATION ROADMAP

**7.1** ***Tapping Village Level Governance for water management and conservation:*** Nagaland is an example of participatory village level land based resource governance. The customs and sanctions dictate the use and management of land, water, forest, biodiversity and other resources. Therefore, it is essential to involve village level institutions in management of water resources and implementation of policy initiatives. Village Councils thus need to be involved in various aspects of planning, design, development and management aspects of integrated river basin management plans to be developed by designated stakeholder agencies. If required necessary legal and institutional changes will be made at various level for this purpose. The provisions of the Nagaland Communitization of Public Services Act, 2002 and Nagaland Village and Tribal Council Act, 1970 are considered helpful in this direction.

***7.2 Private Sector participation***: All efforts would be made for mobilizing resources for watershed and river basin level planning as communities would not be able to invest in water resources development at this stage. If required, funding agencies, private sector participation would be encouraged, primarily in the urban water supply sector. However, such private sector investment would be open to public scrutiny based on transparency, accountability and clearance by the Village Level Institution whose water resources will be sourced.

***7.3 Beneficiary participation*** and contribution of work force and other locally available material to be made mandatory at all stages of project.

***7.4 Citizen's implementation of "polluter pays" principle*** will be applicable in Nagaland. The existing WATSAN and water users association will monitor quality of water in rivers and streams and springs and any one polluting will be penalized as per the Village Council decision based on customary sanction or decision taken by the people's assembly impacted by such pollution or contamination of the source. In case such incidence occurs where not an individual but community as a whole is liable, collective action would be undertaken by a joint sitting of the affected village councils.

***7.5 Interested/Committed Stakeholders/Volunteers would be trained*** to assess the water and soil condition in the villages and would regularly report to the designated river basin agencies. Capacity building for technological interventions would be emphasized at the village level.

***7.6 Financing of Projects and service charges:*** Efforts would be made to bring in private sector investment wherever possible for financing water projects. The state water law would provide a clear legal and administrative roadmap in this direction. The State Finance Commission will be empowered to fix tariffs for different uses of water.

***7.7 Community monitoring and performance audit of water resource projects:*** Communities would closely monitor and will have a say in the project performance at every stage of project development and implementation. This would facilitate initiating of timely measures to rectify the errors, if any.

***7.8 Flood and disaster risk mitigation:*** A comprehensive flood management and river zoning strategy will be formulated under this Policy in coordination with State and National Disaster Management Authority.

***7.9 Decentralized and community based rainwater harvesting:*** Traditional and modern rainwater harvesting methods would be mainstreamed by way of attractive incentives in various forms. Education and conservation consciousness has a big role to play in this regard which will be taken up right from the school level. Modules in primary schools will be encouraged to spread water conservation awareness among children and through them involving their parents. Creative methods of exhibitions, painting competitions or science model exhibitions would be encouraged and supported.

***7.10 Enactment of water law for the State of Nagaland:*** Progressive and comprehensive state water legislation will be enacted to provide statutory support to the initiatives undertaken under this policy for their long-term sustainability. The state government shall enact the water law for the state to operationalise State Water Policy. If required, necessary amendments to be carried out in existing legislations, rules to harmonise it with the water act.

*7.11 **Creating "Water Reserves":*** The water reserve to be created comprises of two components-basic human needs reserve and ecological reserve. The reservation of water for these two components would be granted precedence in water allocation and abstraction. Creation of 'water reserves' aims at securing basic water supply in terms of quality and quantity to satisfy basic human needs to people who rely upon the water resource. It further aims at securing aquatic ecosystems in order to engineer ecological sustainable development and use of relevant water resource. The endeavour of the state is to firstly, identity water resources for creating 'water reserves'. Secondly, provision of measures in consultation with village level institutions such as water management strategies, strategies for water pollution prevention, regulation on abstraction of water at catchment level for protecting the quality and quantity of water reserve.

*7.12 **Assessing State's water footprints**:* The State shall endeavour firstly, to assess direct and virtual water use and water footprints of different activities. Secondly, encourage, by way of incentives, all categories of water users to reduce their water footprint.

*7.13 **Negotiations, Mediation and conciliation within the existing customary justice dispensation mechanism*** to be used for settlement of water related disputes. Village level conflict resolution mechanism to not only resolve but also prevent and minimize the possibility of any conflict arising between or among different water users.

*7.14 **Setting up Nagaland State Water Resources Council***: headed by the Chief Minister as the highest body for monitoring, evaluating and for providing inputs and guidance for the overall implementation of the water policy objectives.

**8. Regional approach:** Looking at water resources from a regional inter-dependence prism has gained ground under the international water law and under the progressive regimes on trans-boundary water cooperation. However, realization of this important approach would be beneficial in domestic context, especially in the unique context of North-Eastern Region where the water resources of all six North-Eastern states are shared water resources. Thus, the states are practically involved in a variety of trade-offs related with ecosystem services provided by natural flow of rivers and other water ecosystems. The state of Nagaland while planning for any major water project likely to impact water availability of neighbouring states would need to organize effective dialogues and follow principle of no significant harm, fairness and information exchange. Water sharing arrangement arising out of any new projects would be made on a scientific and legal basis. Adequate safety measures for flood safeguard, warning system and regional benefits would be incorporated in projects having inter-state conflicts/ramifications. Disputes with neighbouring states would be resolved as per the mandate of Inter-State Water Disputes Act, 1956. Any trans-boundary water dispute or conflict would, require intervention of the Central Government.

**9. Revision of the State Water Policy:** The Water Policy is to be revised every ten years or earlier depending in the changes observed in the state water scenario by communities and agencies mentioned herein above under the Policy.