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NOTIFICATION

No. B.18016/1/2018-I&WR/188, the 12th October, 2020: As per approval of the Council of Ministers in its meeting held on 1.10.2020 conveyed vide No. J.11011/1/2020-Pol/Vol-VI dt.5.10.2020 and in the interest of public service, the Governor of Mizoram is pleased to notify the Mizoram State Water Policy 2020 with immediate effect.

Sanghhin Chinzah,
Secretary to the Govt. of Mizoram,
Irrigation & Water Resources Department.

Mizoram State Water Policy 2020

Background

Water is the most crucial element for sustaining life. The source of water in Mizoram is rain that varies with season and flows into its springs, rivers, lakes, ponds, reservoirs and into the ground. Topography, changing population, changing land use, and variations in rainfall across years are impacting availability of water in the state. A sustainable management of this system is therefore essential and has to be guided by developmental aspirations of the state which would inter-alia account for geographical conditions, hydrological status (surface and ground water), water allocation priorities and other specific needs.

The state of Mizoram, with an area of 21,081 km² is located in the north-eastern part of the country. The state is landlocked and shares an international border with Bangladesh on the west and Myanmar on the east. The GSDP of Mizoram has grown at a CAGR of 11.04% between 2005-06 and 2015-16; and the per capita GSDP in 2015-16 was USD 1,734, which was 12% higher than the national average.¹

Water is the most crucial element for sustaining life and is required for all aspects of life. The principal source of water in Mizoram is precipitation that varies both spatially and temporally, and flows into springs, rivers, lakes, ponds, reservoirs and as ground water. The hilly topography along with the increasing population, changing land-use, and variations in rainfall across years impacts the availability of water in the state.

A sustainable management of water as a resource is, therefore, essential would inter-alia account for geographical conditions, hydrological status (surface and ground water), water demand and allocation priorities, and other specific needs.

Current Supply and Demand Side Scenario of Water Resources in Mizoram

The water consumption scenario in a particular region can be unraveled through an understanding of the demand-supply landscape. This entails an analysis of the precipitation pattern, population growth, agriculture and livestock pattern (including *Jhum*), industrial landscape and energy production scenario is required. Figure 1 provides an analytical framework for estimation of a water balance for the study area.

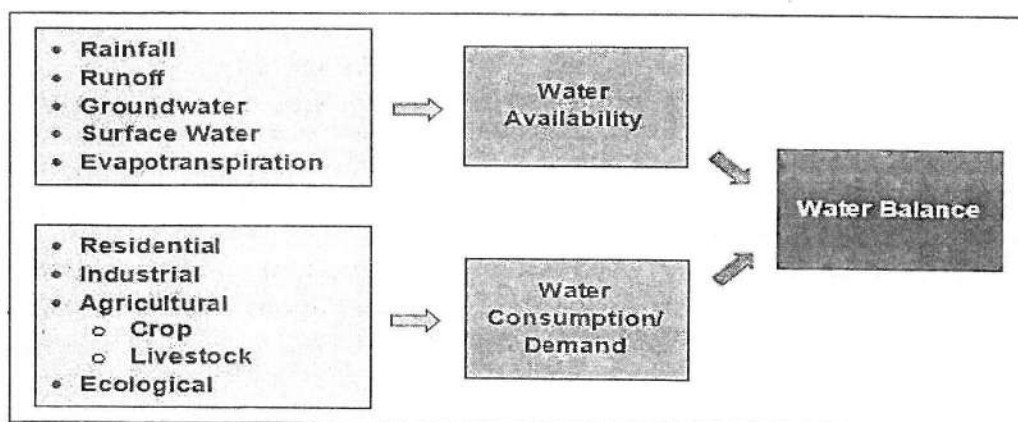


Figure 1: Analytical framework for estimation of water balance for a study area Supply Side Assessment

¹Mizoram: Land of Blue Mountains, IBEF (2017) Accessed from <https://www.ibef.org/download/Mizoram-January-2017.pdf> on 16.11.2018

Ninety percent of the annual precipitation in Mizoram falls between March and September, and 72% of the annual rainfall in the State occurs between the months of June and September. There is scanty rainfall in the winter months, leading to water scarcity issues in certain pockets. Analysis of IMD regional precipitation data for a 115 year period for Nagaland, Manipur, Mizoram and Tripura (NMM), considered as a combined region in the IMD data set, presents a declining trend.² The decline is of the order of 3.94 mm/year at a 99% confidence level. Figure presents the annual trends of precipitation between 1901 and 2015. The observed decline is significantly steeper for the latest 50 years spanning the period 1965-2015 (11.32 mm/year) as compared to 63 years (8 mm/year) of observation since 1901.

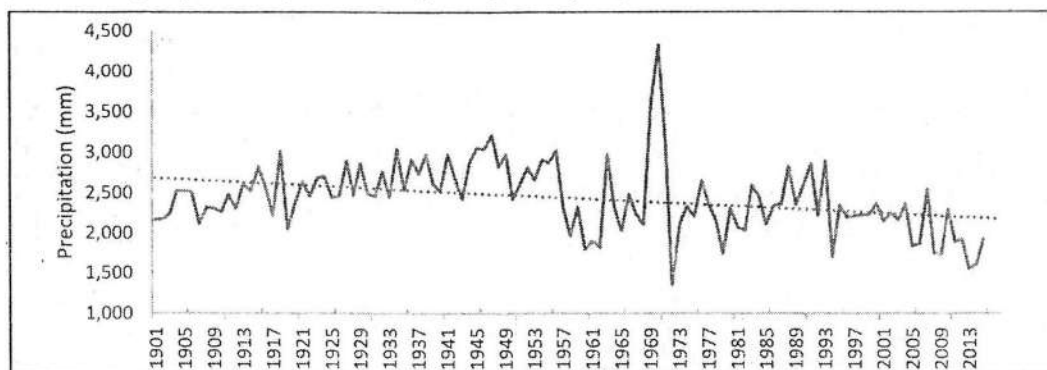


Figure 2: Precipitation trend in the combined NMM region between 1901 and 2015

In Mizoram, owing to the hilly topography and soil characteristics, the groundwater retention capacity is poor. Ground water potential is classified between poor to moderate in 72% of the area of the state (Refer to

Table 1).³ Thus, the above average precipitation in the region does not correspond to a high level of ground water availability. The state has a significantly high (4,500 MW) hydro power potential. However, only 2% of the potential has been tapped. Consequently, water storage (through reservoirs) capacity in the state is low. Thus, owing to inter and intra annual variation – temporal and spatial – in precipitation (which would be exacerbated by human induced climate change), low ground water retention and low surface water retention, it is imperative for the state to prepare for changes in the water availability.

Table 1: Potential zone for ground water in five districts of Mizoram⁴

District	Aizawl	Champhai	Kolasib	Mamit	Serchhip
Potential Zone					
Very Good	109.14	325.71	112.92	287.93	140.78
Good	593.55	754.36	297.51	611.96	255.59
Moderate	1,005.20	933.53	457.26	983.92	459.54
Poor	1,868.42	1,172.33	514.82	1,141.95	565.69
Total Area	3,576.31	3,185.83	1,382.51	3,025.74	1,421.60

Demand side assessment

² IORA Analysis based on IMD Area weighted monthly, seasonal and annual rainfall (in mm) for 36 meteorological subdivisions from 1901-2015. Accessed from <https://data.gov.in/resources/area-weighted-monthly-seasonal-and-annual-rainfall-mm-36-meteorological-subdivisions-1901> on 08.09.2018

³ Data provided by Water Resources Department. Data for five districts was made available. Once, data for the remaining districts are provided, it would be incorporated into the background note.

⁴ Data provided by Water Resources Department. Data for five districts was made available. Once, data for the remaining districts are provided, it would be incorporated into the background note.

The population of Mizoram has increased by 5.5 times between 1951 and 2011.⁵ There has been significant migration from rural to urban regions, with an estimated 52% population residing in urban regions (as per Census 2011). Per capita water demand in urban areas is 2.375 times higher than that in rural areas (135 lpcd in urban areas).⁶ Domestic water demand has increased from 3.23 BCM in 1951 to 35.64 BCM in 2011 with the urban water demand accounting for 85% of the rise.

Mizoram has mild climate which is suitable for cultivation of crops throughout the year. However, due to scarcity of water during dry period crops cannot be grown throughout the year. In many parts of the State, rice can be grown two times in a year but due to scarcity of water during winter season, rice is grown only during Kharif season in many potential areas. Similarly, terraces constructed in many places leading to permanent cultivation in jhum area, cannot be cultivated during dry season because of limited water storage facilities.

Further it is noted that area under paddy has declined in the State by 32% from 54,541 ha to 36,858 ha between 2007-08 and 2016-17, though it remains as the major crop grown in Mizoram. 32% of the area under agricultural/horticultural crops in 2016-17 were under Banana, Mizo Chilli and Orange. Figure 3 provides a snapshot of area under different crops in the state over the last decade.⁷ Area under *Jhum* cultivation has declined by 24% over the last decade owing to numerous policies of the Government of Mizoram.

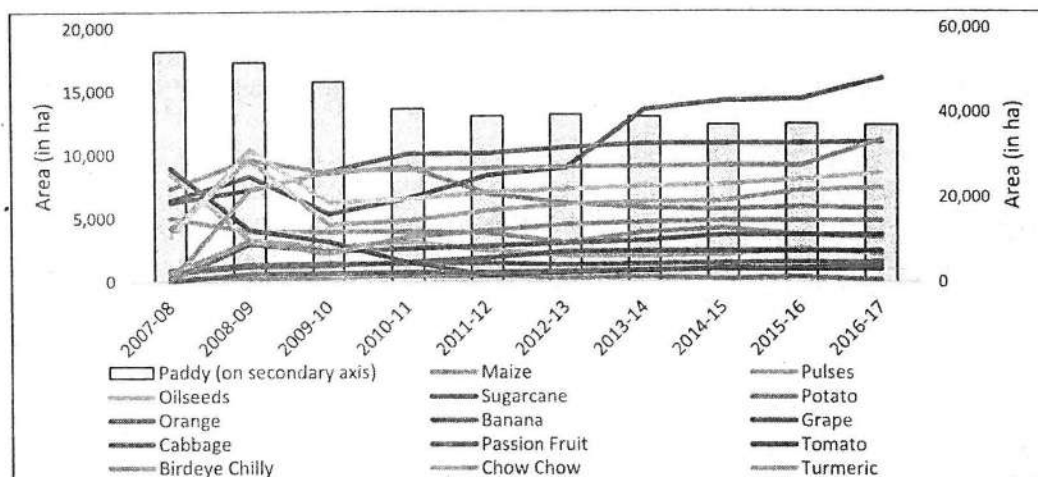


Figure 3: Overview of area under various crops grown in Mizoram between 2007-08 and 2016-17

⁵Census of India – 2011, Provisional Population Totals, Mizoram. Accessed from http://censusindia.gov.in/2011-prov-results/data_files/mizoram/Provisional_Population_Mizoram.pdf on 10.09.2018

⁶ Accessed from <http://indiaenvironmentportal.org.in/files/Water%20consumption%20patterns.pdf> on 16.11.2018 and

Accessed from <http://megphed.gov.in/standards/guidesrural.pdf> on 16.11.2018

⁷ Statistical Abstract of Mizoram: 2017, Directorate of Economics and Statistics, Government of Mizoram

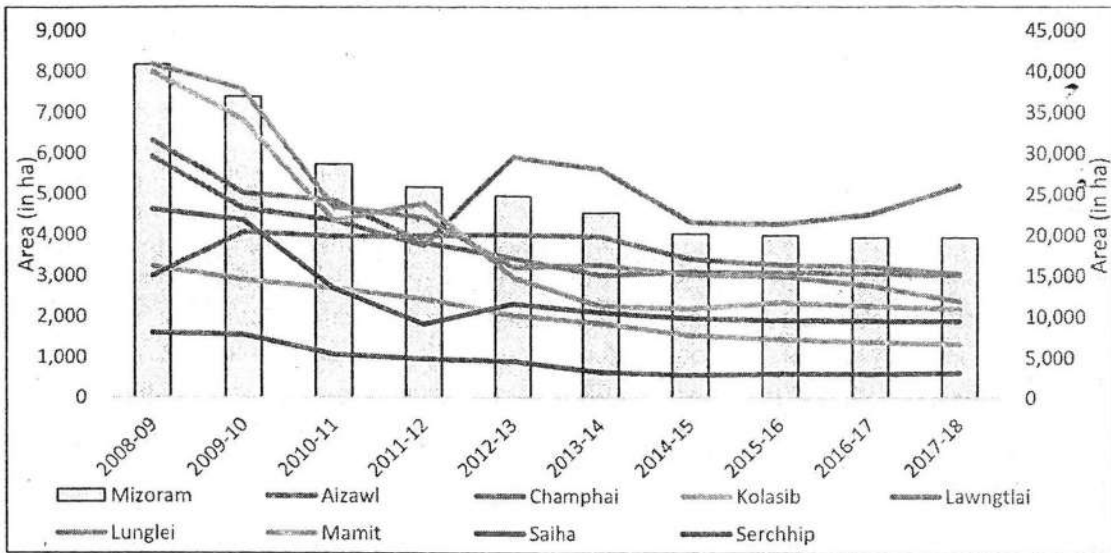


Figure 4: District-wise area under Jhum cultivation in Mizoram

As reflected in figure 4, area under Jhum cultivation in the State has decreased as well due to intensive efforts of the Government to avoid deforestation and hence drying up of water sources. However, area under cultivation of rice in flat land (WRC) increases by 42.25% from 2010 to 2017 in the State.

The Government of Mizoram has promoted livestock in Mizoram as a measure of improving livelihood quality in terms of income and nutrition in rural areas. Rearing of animals provides a substantial supplementary income to rural households. The total number of livestock in Mizoram has increased by 20% between 1977 and 2012. Figure 5 provides an overview of the growth of various types of livestock in the period between 1977 and 2012.

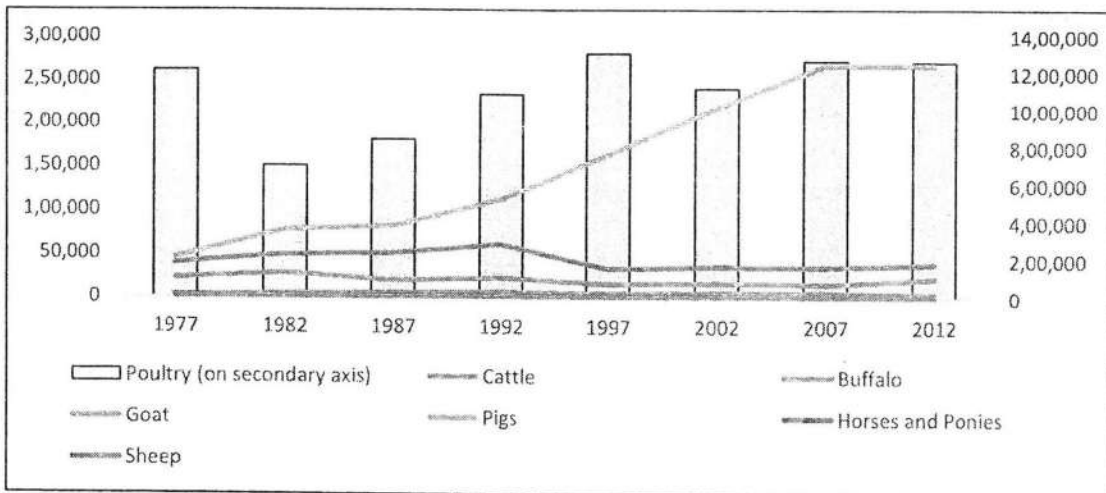


Figure 5: Overview of number of livestock in Mizoram between 1977 and 2012

Mizoram remains a major importer of electricity with 645.73 MU imported in 2016-17. Only 7.4% of the total electricity consumed is generated within the state. Thermal and diesel power production (which are traditionally large consumers of water) in the state has been zero since FY 2015-16. While there are no energy intensive industries in Mizoram currently, with

enhanced connectivity at the domestic and international front (owing to its unique location with an international boundary with two countries), there is a scope for expansion in this front.

Need for State Water Policy

The above section highlights the changes in various competing water consumption sectors in the state. With the ever growing population, greater developmental aspirations and enhanced connectivity the growth of these sectors can be exponential in the future. Owing to the same, it is imperative for the Government of Mizoram to put in place a well-defined State Water Policy that encompasses various issues related to the management of water resources. The water policy must be in-line with the National Water Policy, 2012. The policy must be under the aegis of the concept of integrated water resource development. This would ensure an egalitarian approach towards management and distribution of water resources. Further, there is a need to prioritize the distribution of water to various competing uses in time of water scarcity. The state water policy must also outline the need for capacity development of all stakeholders for awareness, understanding and management of issues related to water management. Finally, it should lay the basis for providing a sound institutional framework for proper implementation of the policy.

1. Preamble

- 1.1 Water is fundamental to life, livelihood, food security and sustainable development. India has more than 18 % of the world's population, but has only 4% of world's renewable water resources and 2.4% of world's land area. There are further limits on utilizable quantities of water owing to uneven distribution over time and space. In addition, there are challenges of frequent floods and droughts in one or the other part of the country. With a growing population and rising needs of a fast developing nation 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.
- 1.2 The state of Mizoram covers an area of 21,081 sq. km, which is 0.68% of the total area of the country. The state is covered by two river basins (as per CWC river basin classification), namely the Barak and others (39% of the state) and the minor rivers flowing into Myanmar and Bangladesh (61% of the state).ⁱThe highly variable inter annual rainfall leads to droughts and floods in the State frequently. Floods greatly impact the low lying flat lands leading to continuous submergence of areas under rice, washing away wet rice cultivated (WRC) lands, and damaging irrigation canals amongst others. In 2017, rainfall of the order of 2803.7 mm, much higher than average annual rainfall destroyed many parts of the wet rice cultivation area in the State.
- 1.3 The objective of the Mizoram State Water Policy, 2020 is to take cognizance of the existing situation in Mizoram, to propose a framework for creation of a system of laws and institutions and for a plan of action with a unified perspective.

2. Overview of Water Resources of the State

2.1 Rainfall

Mizoram receives high rainfall with the average rainfall being above 2,000 mm.ⁱⁱMajority of the precipitation occurs between the months of May and September. The heavy rains during the monsoons, coupled with the hilly topography of the state leads to high surface runoff. There is a high inter-annual variability in the precipitation, and the precipitation presents a declining trend.ⁱⁱⁱ

2.2 Surface Water

The predominant sources of water in Mizoram are surface water in rivers, streams, ponds and natural springs and sub-surface water occurring as ground water. Mizoram has two main river basins within its administrative boundary, namely, Barak and others and minor rivers flowing into Bangladesh and Myanmar.^{iv}

The catchment area of Barak and other Basin in the state is 8,866 sq. km, which is 39% of the total geographical area of the state. The minor rivers flowing into Bangladesh and Myanmar covers the remaining 61% of the state.^{iv}

There are two major types of rivers in Mizoram according to their direction of flow; rivers which flow in North direction namely, Langkaih, Teirei, Tut, Tlawng, Lau, Meidum, Tuichhuahen, Chemlui, Serlui, Tural, Tuirini, Tuivawl, Tuivai and Tuisa; and rivers flowing in Southern direction namely, Khawthlangtuipui, Tuichawng, Mar, De, Kau, Phairuang, Chhimituipui, Ngengpui, Palak, Mat, Ngengrual, Vanva, Tuichang, Tuipui and Tiau.

2.3 Ground water

Geologically the State is covered by rocks of semi-consolidated lower tertiary formations ranging in age from Oligocene to Miocene age. Being a majorly hilly state, the ground water potential in more than half the area within the districts are classified as poor to moderate.^vThe ground water infrastructure development in the state is still at a nascent stage.^{vi}

3. Principles of the Water Policy

- 3.1 The ownership of water resides with the State as publicly owned resource with entitlement for individuals, communities and service providers to use water without owning it.
- 3.2 As water is a common heritage, having economic value, the responsibility for its regulated use and conservation is vested with the State.
- 3.3 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.
- 3.4 The basic principles for the Mizoram State Water Policy, 2020 is to plan, develop and manage water resources keeping in view the need to be governed by a common integrated perspective considering local, regional, State and national context.
- 3.5 The planning and management of the resource is to be done on an environmentally sound basis whereby the human, social and economic needs are met as well.
- 3.6 Principle of equity and social justice must inform use and allocation of water.
- 3.7 Governance of the resources to be done through transparent informed decision making meeting the objectives of equity, social justice and sustainability. Meaningful intensive participation, transparency and accountability should guide decision making and regulation of water resources.
- 3.8 The basic units of planning for conservation and management of water are micro watersheds of the larger river basins in the State, ensuring a resource based approach.
- 3.9 Water needs to be managed efficiently 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.
- 3.10 Water is essential for sustenance of eco-system, and therefore, minimum ecological needs (Ecological Flows) should be given due consideration.
- 3.11 Safe Water for drinking and sanitation needs to be considered a pre-emptive need, 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. Water available after meeting the above needs should be conserved.
- 3.12 All the elements of the water cycle, i.e., evapotranspiration, precipitation, runoff, river, lakes, soil moisture, and ground water, sea, etc., are interdependent and the basic hydrological unit is the river basin, which should be considered as the basic hydrological unit for planning.
- 3.13 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.

4 Uses of Water

- 4.1 Water is required for a number of functions such as domestic, agricultural, hydro-power, industry, thermal power, navigation and recreation among others. Utilization of all these diverse uses of water is competitive in nature and need to be prioritized and optimized.
- 4.2 The Government of Mizoram and the local bodies (governance institutions) must ensure access to a minimum quantity of potable water for essential health and hygiene to all its citizens, available within easy reach of their households.
- 4.3 Ecological needs of the river should be determined, through scientific study, and should accommodate developmental needs. A portion of river flows should be kept aside to meet 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.
- 4.4 Community should 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 should be institutionalized and strengthened.
- 4.5 In the planning and operation of systems, priorities of water allocation need to be decided. It should be broadly be as follows –
 - 4.5.1 Drinking Water & Sanitation
 - 4.5.2 Minimum Environmental and Ecological needs
 - 4.5.3 Agriculture & Allied purposes
 - 4.5.4 Industries & Commercial
 - 4.5.5 Hydropower

5 Adaptation to Climate Change

- 5.1 Climate Change impacts coupled with developmental pressure has its negative effect on the fragile Mountain Ecosystem of Mizoram.
- 5.2 Rainfall in Mizoram indicates a declining trend.^{vi} Climate change is likely to increase the variability of water resources further affecting human health and livelihoods. Therefore, special impetus should be given towards mitigation at micro level by enhancing the capabilities of community to adopt climate resilient technological options.
- 5.3 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. Efficient use of water in agriculture system and other uses and avoiding wastages should be the core principles guiding management of the scarce resource.
- 5.4 The anticipated variability in availability of water because of climate change should be dealt with by incorporating appropriate water storage in various forms, namely, soil moisture, ponds, ground water, small and large reservoirs and their combination. The state should be incentivized to increase water storage capacity, which inter-alia should include revival of traditional water harvesting structures and water bodies.
- 5.5 The trends in water availability due to various factors including climate change must be assessed and accounted for during water resources planning.
- 5.6 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.

- 5.7 All programmes dealing with water augmentation need to integrate climate change adaptation needs.
- 5.8 Planning and management of water resources structures, such as, dams, flood embankments, afforestation, etc., should incorporate appropriate infrastructure designs to accommodate the anticipated changes in climate. The acceptability criteria in regard to new water resources projects needs to be re-worked in view of the likely climate changes.

6 Enhancing Water Available for Use (Supply-side Enhancement)

- 6.1 The availability of water resources and its use by various sectors in the river basins within the State need to be assessed scientifically, reviewed at 5 year intervals. The review process should be fully participatory involving local communities.
- 6.2 While the availability of water is limited, the demand of water is ever-increasing rapidly due to growing population. Further, urbanization, industrialization and increased economic development in the coming years would further lead to increased water demand. Therefore, availability of water for utilization needs to be augmented to meet increasing demands of water.
- 6.3 Conservation of forests to ensure perennial water availability needs to be mainstreamed. There is a need to map the spring sheds within the forest areas in the State and maintain the same.
- 6.4 Aquifers need to be mapped to know the quantum and quality of replenishable as well as non-replenishable ground water resource in the state. It should be ensured that only replenishable water is extracted from ground water.
- 6.5 Integrated Watershed development activities with water conservation 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 water.
- 6.6 Declining ground water levels need to be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community based management of aquifers. The suitable and appropriate technologies on artificial recharging projects should 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.
- 6.7 Inter-basin water transfers, if feasible, may be considered after evaluating the environmental, economic and social impacts of such transfers. If feasible, it will not only help in increasing production but also for meeting basic human needs and achieving equity and social justice. Inter-basin transfers of water should be considered on the basis of merits of each case
- 6.8 To avoid wastage of water, enhance conservation, and ensure availability, water should increasingly be subjected to allocation and pricing on economic principles across its various users.
- 6.9 A Water Regulatory Authority (WRA) should be established in Mizoram. The authority, inter-alia, will fix and regulate the water tariff system and charges, in general, according to the principles stated in this Policy in an autonomous manner. Such tariff will be periodically reviewed.
- 6.10 In order to meet equity, efficiency and economic principles, the water charges should preferably as a rule be determined on volumetric basis.
- 6.11 Recycle and reuse of water, after treatment to specified standards, should also be incentivized through a properly planned tariff system. Water Users Associations

(WUAs)/Village Water and Sanitation (WATSAN) Committee should be 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 in their jurisdiction. WUAs/Village WATSAN Committee should be given the freedom to fix rates subject to floor rates determined by WRAs.

- 6.12 Heavy underpricing of electricity leads to wasteful use of both electricity and water. This needs to be reversed. As an alternative, where limited surface water/ground water use for agriculture at a subsidized cost is considered desirable, separate electric feeders for such a use should be considered. The pricing will fix at affordable to the level of economic condition with due consideration of subsidize rate of electricity for, all domestic uses of water.

7 Ensuring Water Quality

- 7.1 Both surface water and ground water shall be regularly monitored for quality. A monitoring and surveillance programme shall be undertaken for effecting improvements in different parameters.
- 7.2 Water quality parameters for different uses shall continuously be reviewed with a view to effecting improvement in water quality.
- 7.3 Effluents shall as far as possible be treated to acceptable levels and standards before discharging them in natural streams. Backwash discharge in water treatment plants shall also be treated before release into the open.
- 7.4 The principle of 'polluter pays' should be followed in management of polluted water.
- 7.5 Necessary legislation may be enacted for preservation of existing water bodies and preventing encroachment of the same and consequent deterioration of water quality.
- 7.6 It has to adopt a community based approach, involving the available existing infrastructure for drinking water quality and testing incorporated broader issues of accessibility, sustainability, community participation, human resource development and affordability.

8 Demand-side Management

- 8.1 Demand-side Management is the key to the future of water security in the state of Mizoram. Efficiency of utilization in diverse uses of water, particularly agricultural uses need to be improved.
- 8.2 Efforts need to be made to fulfil the domestic water demand by improving water supply infrastructure in urban and rural areas. Further, water use efficiency needs to be promoted through introduction of water meters and domestic water saving devices at affordable cost to all the consumers. New and efficient technologies such as dual piping system, for collecting sewage and waste water to be recycled and reused should be developed wherever possible, in the new townships.
- 8.3 Also it is important to assess the full economic value of forest and water resources in order to put in place appropriate incentives to support natural resource management for the sustainable provision of services. It is recommended that the economic valuation of these services be integrated within GSDP to allow awareness-raising on the importance of environmental services and equitable sharing of costs and benefits between resource users and providers.
- 8.4 Progressive water audit systems need to be put in place after the launch of Mizoram State Water Policy, 2020. In the agricultural sector, improved irrigation practices aimed at reduction in water losses should be adopted by introduction of suitable technology. In the

light of developmental potential and plans of the State, use of treated and wastewater should be encouraged, example in thermal power plants. Industries generating effluents with quality above permissible limits should install water treatment and recycling systems.

- 8.5 Taking into account the fact that substantial losses of raw and treated water take place between the bulk storage, distribution and usage points thereby reducing availability to the ultimate users and financial losses to the supplying agencies as well as giving rise to deficiency in service and dissatisfaction with the public services, audit of the working of systems shall be carried out periodically in accordance with the guidelines for water audit and water conservation and rectification measures initiated where necessary.
- 8.6 Systems should be in place to benchmark water uses for different purposes, i.e., systems to assess water footprints. Also regular water auditing systems should be developed to promote and incentivize efficient use of water. The 'project' and the 'basin' level water use efficiencies need to be improved through continuous water balance and water accounting studies.
- 8.7 The project appraisal and environment impact assessment for water uses, particularly for industrial projects, should, inter-alia, include the analysis of the water footprints for the use.
- 8.8 Pricing of water should 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, should be arrived at through independent statutory Water Regulatory Authority after wide ranging consultation with all stakeholders.
- 8.9 In order to meet equity, efficiency and economic principles, the water charges should preferably/as a rule be determined on volumetric basis. Such charges should be reviewed periodically.
- 8.10 Recycle and reuse of water, after treatment to specified standards, should also be incentivized through a properly planned tariff system.
- 8.11 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, should 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.
- 8.12 Water Users Associations (WUAs)/ Village WATSAN Committees should be given statutory powers to collect and retain a portion of water charges for managing the volumetric quantum of water allotted to them and maintain the distribution system in their jurisdiction. WUAs/ Village WATSAN Committees should be given the freedom to fix rates subject to floor rates determined by WRAs.⁸

9 Conservation of Springsheds, River Corridors, Water Bodies and Infrastructure

- 9.1 Conservation of spring sheds, soil along the mountain sides and valleys, rivers, river corridors, water bodies, reservoirs, canals, and other water conserving infrastructure should 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 may be managed to the extent possible in an integrated manner to balance the

⁸ In line with the National Water Policy

flooding, environment and social issues as prevalent laws through planned development of urban areas, in particular.

- 9.2 Encroachments and diversion of water bodies (like rivers, lakes, tanks, ponds, etc.) and drainage channels (irrigated area as well as urban area drainage) must not be allowed, and wherever it has taken place, it should be restored to the extent feasible and maintained properly.
- 9.3 Urban settlements, encroachments and any developmental activities in the protected upstream forest areas of springs/reservoirs/water bodies, key aquifer recharge areas that pose a potential threat of contamination, pollution, reduced recharge and those endangering wild and human life should be strictly regulated.
- 9.4 Sources of water and water bodies should not be allowed to get polluted. System of third party periodic inspection should be evolved and stringent punitive actions be taken against the persons responsible for pollution.
- 9.5 The water resources infrastructure should 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. Contracts for construction of projects should have inbuilt provision for longer periods of maintenance and handing over back the infrastructure in good condition.
- 9.6 Legally empowered dam safety services need to be ensured in the States as well as at the Centre. Appropriate safety measures, including downstream flood management, for each dam should be undertaken on top priority.
- 9.7 MGNREGA led rainwater harvesting structures need to be audited annually by Water User Associations/ Village WATSAN Committee and repaired if necessary. Special provisions for repair and retro fitting charges for these infrastructures need to be made.

10 Project Planning and Implementation

- 10.1 Though, currently the state of Mizoram has adequate water availability, the effect of future impacts of climate change and other factors need to be accounted in the planning of projects. Projects related to water resources should be planned taking into account changes in parameters due to climate variability.
- 10.2 Being inter-disciplinary in nature, water resources projects should be planned considering social and environmental aspects in addition to techno-economic considerations in consultation with project affected and beneficiary families. The integrated water resources management with emphasis on finding reasonable and generally acceptable solutions for most of the stakeholders should be followed for planning and management of water resources projects. All clearances, including environmental and investment clearances, be made time bound.
- 10.3 All components of water resources projects should be planned and executed in a participatory manner so that intended benefits start accruing immediately and there is no gap between potential created and potential utilized.
- 10.4 Local governing bodies like Panchayats, Municipalities, Corporations, Water Users Associations, Village WATSAN Committee and NGOs wherever applicable, should be involved in planning of the projects.
- 10.5 The unique needs and aspirations of communities including those of Scheduled Tribes and Scheduled Casts, women and other weaker sections of the society should be given due consideration. Extra provisioning of water for special needs of hospitals and schools also

- needs to be ensured. The water resource projects need to factor in the ever increasing needs of population, livestock, agriculture, industry and environmental flows.
- 10.6 All water resources projects, including hydro power projects, should be planned to the extent feasible as multi-purpose projects with provision of storage to derive maximum benefit from available topology and water resources.
 - 10.7 The planning of projects in hilly areas shall take into account the need to assure drinking water supply, hydro-power development and irrigation networks appropriate to the terrain of the area. The cost benefit analysis of projects in these areas shall reflect these aspects.
 - 10.8 Time and cost overruns and deficient realization of benefits characterizing most water related projects shall be overcome by upgrading the quality of project preparation and management. The inadequate funding of projects should be obviated by an optimal allocation of resources on the basis of prioritization, having regard to the early completion of on-going projects as well as the need to reduce regional imbalances.
 - 10.9 A close monitoring of projects to identify bottlenecks and to adopt timely measures to obviate time and cost overrun should be an integral part of project planning and execution. Longitudinal studies should be carried out to monitor and evaluate the performance and socio-economic impact of water resource projects.
 - 10.10 The drainage system should form an integral part of any irrigation project right from the planning stage.

11 Management of Droughts, Floods and Erosion

- 11.1 The inter-annual variation in rainfall cumulated with the prevalence of jhum cultivation (area under which has declined moderately in the past decade^{viii}) increases the likelihood of increased intensity of surface run-offs and hence flash floods in regions. Further erratic rainfall is a major cause for landslides.
- 11.2 In order to prevent loss of land eroded by the river, which causes permanent loss, revetments, spurs, embankments, etc., should be planned, executed, monitored and maintained on the basis of morphological studies. This will become increasingly more important, since climate change is likely to increase the rainfall intensity, and hence, soil erosion.
- 11.3 The feasibility of catchment area treatment and construction of check dams for management of floods and droughts should be looked at.
- 11.4 Operating procedures for reservoirs should be evolved and implemented in such a manner to have flood cushion and to reduce trapping of sediment during flood season. These procedures should be based on sound decision support system
- 11.5 A comprehensive flood management and river zoning strategy will be formulated under this Policy in coordination with State and National Disaster Management Authority.
- 11.6 Flood waters should be diverted for storage with sufficient capacity to ensure water availability to users in droughts like and flood situations in Mizoram. Communities need to be involved in preparing an action plan for dealing with the flood/drought situations.
- 11.7 Construction of rain water harvesting structures should be encouraged to check soil erosion and flash floods.
- 11.8 The State shall undertake steps to ensure that indiscriminate occupation and exploitation of land near the river banks is discouraged. Economic activity on river banks and beds must be properly regulated.
- 11.9 A comprehensive flood management and river zoning strategy will be formulated under this Policy in coordination with State and National Disaster Management Authority.

12 Water Supply and Sanitation

- 12.1 Access to safe and reliable water and sanitation services is essential for a healthy life, and thus for social development and poverty alleviation. The ultimate goal is therefore universal coverage of improved water and sanitation services. Sanitation is a basic requirement for public health and to combat water borne diseases. However, sanitation coverage lacks behind water supply coverage, so an integrated approach to the provision of both is necessary, with particular attention to the latter.
- 12.2 There is a need to remove the large disparity between stipulations for water supply in urban areas and in rural areas. Efforts should be made to provide improved water supply in rural areas with proper sewerage facilities. Least water intensive sanitation and sewerage systems with decentralized sewage treatment plants should be incentivized.
- 12.3 The community will be effectively involved in the planning and management of drinking water supply and sanitation facilities in the urban as well rural areas. Community level organization and appropriate local level bodies shall manage, operate and maintain these services on day-today basis.
- 12.4 Urban domestic water systems need to collect and publish water accounts and water audit reports indicating leakages and pilferages, which should be reduced taking into due consideration social issues.
- 12.5 Urban water supply and sewage treatment schemes should be integrated and executed simultaneously. Water supply bills should include sewerage charges
- 12.6 Urban domestic water supplies should preferably be from surface water. Where alternate supplies are available, a source with better reliability and quality needs to be assigned to domestic water supply should be possible. Also, reuse of urban water effluents from kitchens and bathrooms, after primary treatment, in flush toilets should be encouraged.
- 12.7 In urban and industrial areas, rainwater harvesting, wherever techno economically feasible, should be encouraged to increase availability of utilizable water. Implementation of rainwater harvesting should include scientific monitoring of parameters like hydrogeology, groundwater contamination, pollution and spring discharges.
- 12.8 Industries in water short regions may be allowed to either withdraw only the makeup water or should have an obligation to return treated effluent to a specified standard back to the hydrologic system. Tendencies to unnecessarily use more water within the plant to avoid treatment or to pollute ground water need to be prevented.
- 12.9 Monitoring and surveillance of the quality of drinking water with emphasis on prevention of water borne diseases and proper operation and maintenance of the water supply system is of utmost importance. A "Catchment Area Approach" shall be adopted by involving grass root level educational and technical institutions in utilizing existing resources and strengthening them by providing additional technical and financial support for their activities in this area. Awareness on matter related to water borne diseases, their manifestation, symptoms, and aspects of prevention and simple remedies shall be developed through effective information, education and communication programmes.
- 12.10A transformation from a target based, supply-driven approach that pays little attention to the actual practices and/or preferences of the end users, to a demand- based approach, where users get the service that they want and are willing to pay for, is urgently required. Implementation of a participatory demand driven approach will ensure that the public obtains the level of service they desire and can afford to pay for through the mechanism of a tariff policy.

13 Maintenance and Modernization

- 13.1 Structures and systems created for water resource management should be properly maintained in good health. Appropriate annual budgetary provisions should be made for this purpose. Preventive maintenance shall be given due attention for reducing overall maintenance cost, optimizing water use and making projects sustainable. There should be a regular monitoring of structures and systems and necessary rehabilitation and modernization programs should be undertaken.
- 13.2 Formation of Water User's Associations with authority and responsibility shall be encouraged within a defined time frame to facilitate the management, including maintenance of irrigation systems in a participatory manner.
- 13.3 In view of sustainability measures, the created water supply facilities in rural areas used to hand over to Village WATSAN Committee (Village Water and Sanitation Committee). The Government of Mizoram should give back up support to Village WATSAN Committee in case of major repairs which is beyond their capacity and financial support.

14 Financial and Physical Sustainability

- 14.1 Besides developing additional water resource facilities, the physical and financial sustainability of existing facilities needs special attention. Water user charges shall attempt to cover gradually the operation and maintenance charges of providing the service initially as well as a part of the capital costs. Subsidies on water rates shall be well targeted and transparent.
- 14.2 All linked inter-departmental financial resources available shall be pooled and the nodal department would facilitate further leveraging of resources for raising funds for capital investment. A revolving fund may be created to fund prioritized activities in select areas.
- 14.3 There is an urgent need of a paradigm shift in the management of water resources sector, from the emphasis on the development and expansion of water resource infrastructure for diverse uses, to improvement of the performance of the existing water resource facilities. Therefore, allocation of funds under the water resources sector should be reprioritized to ensure that needs for development as well as operation and maintenance of the facilities are met in an equitable and sustainable manner.
- 14.4 A Citizen's Charter shall be developed with a view to guaranteeing efficiency, transparency and accountability in the delivery of drinking water and irrigation services.
- 14.5 A special programme needs to launch to envisage transformation from supply driven approach to demand driven approach. The key element for the successful implementation of the programme is people's participation by involving target audiences through generating consciousness and awareness. The strategy addresses all sections of community to bring about the relevant changes for improved sanitation, hygiene practices and safe drinking water.
- 14.6 The key issues which need immediate attention for sustainability of water sources to ensure effective management and adopt better governance practices to promote conservation of water and artificial recharge by ensuring community participation.

15 Trans Boundary Rivers

- 15.1 River systems do not follow administrative boundaries. The state of Mizoram falls in two river basins (as per CWC river basin classification), namely (i) Barak and others and (ii) minor rivers draining into Myanmar and Bangladesh.^{ix}
- 15.2 The upstream regions of both these basins lay in the state of Mizoram, with 8,866 sq. km of the Barak and others basin; and 14,091 sq. km of the minor rivers draining into Myanmar and Bangladesh falling within the state.
- 15.3 It is of paramount importance to maintain ecological stability in the upstream regions of river basins.
- 15.4 Even while accepting the principle of basin as a unit of development, on the basis of practicability and easy implementability, efforts should be made to enter into international agreements with neighboring countries on bilateral basis for exchange of hydrological data of international rivers on near real-time basis.
- 15.5 Negotiations about sharing and management of water of international rivers should be done on bilateral basis in consultative association with riparian States keeping paramount the national interest. Adequate institutional arrangements at the Center should be set up to implement international agreements.

16 Database and Information System

- 16.1 The collection, compilation, storage, analysis and use of accurate, comprehensive, timely, and quality hydro-meteorological data is a necessary pre-requisite for improved water management. Good quality data will serve as key to all hydrologic analysis.
- 16.2 Therefore, a concerted effort will be made for the creation and strengthening of Hydro-meteorological Information System for the entire State of Mizoram. The reliable and regularly updated data on the state of water resources, water management, and socio-economic challenges and constraints vis-à-vis water in Mizoram are needed for informed and evidence-based decision making.
- 16.3 For Agriculture sector it is very important to have systematic and up to date data on weather and a system to transfer it to the farmers is a very easy and simple way so that cultivation of crops in the State will be productive. Agriculture Department has been keeping monthly rainfall record of the State from 8 districts since 1994. But it does not include weather forecast programme, it will be of great help for the farmers if the State can have data base and information system like Weather Stations.
- 16.4 A modern integrated monitoring network, along with reconstruction and modernization of various existing works, construction of data center, installing gate sensors at various outlets will be undertaken.
- 16.5 All State and Central agencies, departments and entities – public or private – those who collect, maintain, collate or archive hydro-meteorological data shall contribute data to this information system after ensuring its validity and accuracy. Full access to the data in this information system shall be ensured to all water users and stake holders – public or private and concerned State and Central agencies and departments.
- 16.6 For the same the state of Mizoram would undertake the following actions –
 - 16.6.1 Assess and improve the collection of hydrological and meteorological data and establish optimum number of weather stations across the state.
 - 16.6.2 Appoint a suitable research institution with proper technical expertise to collect water data from weather stations placed optimally to provide a representative data for watersheds and basins in Mizoram.

- 16.6.3 Identify water sources, catchment areas and aquifers, update and prepare water resource maps for Mizoram in close collaboration with Mizoram Remote Sensing and Application Centre and with community participation.
- 16.6.4 Carry out a census of all water sources and their users.
- 16.6.5 Map and register all private and communal water sources and springs.
- 16.6.6 Develop and implement a water research strategy.
- 16.6.7 Develop a strategy for dissemination and uptake of research results.
- 16.6.8 Facilitate financial support and technical advisory to increase the research capacity, education programmes and research communication/dissemination of universities and research institutes.
- 16.6.9 Promote interdisciplinary research and collaboration between researchers and other stakeholders to undertake joint and participatory research and testing.
- 16.6.10 Develop and roll out new methods for water management and utilization (e.g. artificial recharge of ground water, reclamation and repair/renovation and restoration of water bodies) and water conservation practices (e.g. rainwater harvesting, soil moisture conservation).
- 16.6.11 Strengthen district level laboratories, establish a new State Level Water Testing Laboratory, and distribute water testing kits and train water user associations/beneficiary groups on analysis of drinking water.
- 16.6.12 Periodically reassess the ground water potential on a scientific basis, taking into consideration the quality of the water available and economic viability of its extraction.
- 16.6.13 Undertake comprehensive and reliable projections of water demands.
- 16.6.14 Establish a publicly accessible online State water resources information system, as per the provisions of the State Water Act, with regularly updated data and assessment of the State's water resources. The water resources information system shall cover multiples levels, from the State level to district and sub-basin levels.
- 16.6.15 Develop, test with stakeholders, demonstrate and introduce new technologies and approaches for improving water management (e.g. under the Appropriate Technology Programme).

17 Research, Training and Capacity Building Needs

- 17.1 There is a need to assess on a periodic basis the exact quantum of water available from surface and groundwater sources in order to have perspective planning and management in water resource, conservation and development.
- 17.2 In hilly reaches, outburst flood and landslide studies with periodic monitoring along with instrumentation, etc. should be carried out.
- 17.3 Continuing research and advancement in technology shall be promoted to address issues in the water sector in a scientific manner. Innovations in water resources sector should be encouraged, recognized and awarded.
- 17.4 Concerned engineering staff will be continuously trained for running & maintenance of hydro-meteorological data and information management system, to support planning, project formulation and implementation, operation and decision making by the river basin agencies, all water users and water service providers, State departments and other agencies at the river basin, sub-basin and State level.

- 17.5 It is necessary for the State to access adequate grants to update technology, design practices, planning and management practices, preparation of annual water balances and accounts for the site and basin, preparation of hydrologic balances for water systems, benchmarking and performance evaluation.
- 17.6 It needs to be recognized that the field practices in the water sector in advanced countries have been revolutionized by advances in information technology and analytical capabilities. A re-training and quality improvement programme for water planners and managers at all levels in Mizoram, both in private and public sectors, needs to be undertaken.
- 17.7 An autonomous center for research in water policy will be established to evaluate impacts of policy decisions and to evolve policy directives for changing scenario of water resources.
- 17.8 To meet the need of the skilled man-power in the water sector, regular training and academic courses in water management is to be promoted. These training and academic institutions should be regularly updated by developing infrastructure and promoting applied research, which would help to improve the current procedures of analysis and informed decision making in the line departments and by the community.
- 17.9 In lieu of all the above, research can be initiated around the following (but not limited to) overarching themes –
 - 17.9.1 Assess the impacts of climate change on water resource availability in the state.
 - 17.9.2 Identify pathways to adapt to the impacts of climate change.
 - 17.9.3 Assess current data collection infrastructure and gaps in the same.

18 Institutional Arrangements

- 18.1 Mizoram State Water Resources Council under the Chairmanship of Chief Minister would take care of policy planning and co-ordination of the activities of various Departments/ Agencies, Government as well as Civil Society Organizations involved with the Water Sector.
- 18.2 Water Resources Development & Management Authority would be setup under a suitable state legislation to provide the regulatory framework for the water sector. This regulator would be responsible for regulating the use and discharge of water, fix/review water tariff, resolution of water related conflicts and overseeing that sufficient environmental safety measures are undertaken. The Authority would encourage institutional harmony between the traditional or customary community institutions and State agencies to improve the water governance framework and to prevent or arrive at early resolution to water related disputes in the State.
- 18.3 District Water Resources Committee would be empowered to coordinate all activities in the district involving the water sector and to ensure that projects and programmes are implemented in accordance to their respective guidelines from time to time and to ensure convergence wherever possible.
- 18.4 Village Water Resources Committee with adequate women representation would be created to manage their water resources and related infrastructures under the purview of the Regulatory Authority
- 18.5 A permanent Water Disputes Tribunal at the State should be established to resolve the disputes expeditiously in an equitable manner

19 Implementation Strategy of Mizoram State Water Policy, 2020

- 19.1 For implementation of the Mizoram State Water Policy, 2020, Institutional Structures with clear roles should be defined
- 19.2 The Mizoram State Water Policy, 2020 shall be followed by acts, rules, regulations, implementation strategies and operational action plans for realizing the objectives of the policy.
- 19.3 The strategies and plans shall be made for various time periods – short (annual plans), medium (5 year plans) and long term (10 to 20 year plans). These would include specific targets for how the objectives provisions of the Policy will be implemented. These targets shall have clearly defined measurable indicators, timelines and dates, and the progress against these shall be continuously monitored. The lessons learnt from these plans should be fed into the Mizoram Water Policy as addendums every 5 years.
- 19.4 Existing Acts and Policies on water use and management such as Mizoram Water Supplies (Control) Act, 2004 and the Hydro Electric Power Policy of Mizoram, 2010, among others, need to be updated in line with the Mizoram State Water Policy, 2020 for
 - 19.4.1 ensuring more meaningful decision making roles for Water Users' Associations/ Village WATSAN Committees and the Local bodies such as municipalities and village council shall particularly be involved in the operation, maintenance and the management of water related infrastructure/facilities at appropriate levels
 - 19.4.2 ensuring scientific planning of land and water resources taking basin/sub basin as unit with unified perspectives of water in all its forms (including precipitation, soil moisture, ground and surface water) and
 - 19.4.3 ensuring holistic and balanced development of both the catchment and the command areas.
 - 19.4.4 enabling establishment of basin authorities with appropriate powers to plan, manage and regulate utilization of water resource in the basins.
- 19.5 The provisions and adequacy of different regulations enacted in the water sector shall be reviewed and modified, if necessary. Suitable legislations shall be enacted to ensure water rights, prioritization of water use, ground water exploitation, bulk supply, water conservation and harvesting, reconstitution of institutional mechanisms amongst others
- 19.6 Water resources projects and services should be managed with community participation. Wherever the State Government or local governing bodies so decide, the private sector can be encouraged to become a service provider in public private partnership model to meet agreed terms of service delivery, including penalties for failure.
- 19.7 Integrated Water Resources Management (IWRM) taking river basin/sub basin as a unit should be the main principle for planning, development and management of water resources. The departments/organizations at State Government levels should be restructured and made multi-disciplinary accordingly.
- 19.8 Appropriate institutional arrangements for each river basin should be developed to collect and collate all data on regular basis with regard to rainfall, river flows, area irrigated by crops and by source, utilizations for various uses by both surface and ground water and to publish water accounts on ten daily basis every year for each river basin with appropriate water budgets and water accounts based on the hydrologic balances. In addition, water budgeting and water accounting should be carried out for each aquifer.
- 19.9 Appropriate institutional arrangements for each river basin should also be developed for monitoring water quality in both surface and ground waters.

19.10 States should be encouraged and incentivized to undertake reforms and progressive measures for innovations, conservation and efficient utilization of water resources.

20. Alignment with National Water Policy and National Water Mission

20.1 The Mizoram State Water Policy, 2020 aligns with the overarching goals of the National Water Policy. It meets the overall structure and guidelines set by the National Water Policy and adapts the same to state centric issues.

20.2 The Mizoram State Water Policy, 2020 aligns with the over arching goals of the National Water Mission.

Goal	Alignment
Goal I - Comprehensive water data base in public domain and assessment of the impact of climate change on water resource	Section 16 of Mizoram State Water Policy, 2020 Section 17 highlights the need of research on the impacts of climate change and necessary adaptation strategies
Goal II – Citizen & State Action	The overall policy looks at community engagement and action along with state level action
Goal III - Focus on Vulnerable Areas	Section 17 highlights the need of research to identify vulnerable spots and include them in action plans
Goal IV – Improving Water Use Efficiency by 20%	Section 8 highlights the need for improving water-use efficiency, including water-use efficiency across sectors.
Goal V – Promotion of basin level integrated water resources management	The overall policy looks at integrated water resource management including basin level management.

21. Conclusion:

21.1 This policy has been framed taking into consideration the needs and aspirations of the people concerned and the complexities involved in solving the various water-related issues. The State fully understands that the objectives of this policy can be achieved with the concerned Departments playing their role as per their mandate along with support from all other stakeholders who would also be required to carry out their respective roles and work in a collaborative manner to meet the objectives of this policy.

21.2 The State Water Policy may be reviewed /revised periodically as and when the need arises.

References

- ⁱRiver basins in Mizoram. India-WRIS, 2012, River Basin Atlas of India, RRSC-West, NRSC, ISRO, Jodhpur, India
- Barak and Others – Pages C.20 to C.23
 - Minor Rivers Draining into Myanmar and Bangladesh – Pages C.94 to C.97
- ⁱⁱ Rainfall data accessed from data.gov.in. Accessed from <https://data.gov.in/resources/area-weighted-monthly-seasonal-and-annual-rainfall-mm-36-meteorological-subdivisions-1901> on 03.08.2018
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- ^v Based on Groundwater Potential data provided from MRSAC
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- ^{viii} Based on data received from Irrigation and Water Resources Department
- ^{ix}River basins in Mizoram. India-WRIS, 2012, River Basin Atlas of India, RRSC-West, NRSC, ISRO, Jodhpur, India
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