
TO REVIEW AND EXAMINE EXISTING STATE LEVEL REGULATORY AND INSTITUTIONAL FRAMEWORK TO OPERATIONALISE THE NATIONAL WATER POLICY- 2012

STATE REPORT TAMIL NADU

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Executive Summary

The water policy and regulatory framework in Tamil Nadu has been examined based on broader thematic areas that form the basis of the National Water Policy, 2012. The primary objective of the present analysis is to assess the preparedness of the states in terms of regulatory and institutional framework to respond to the directives of the National Water Policy- 2012 (NWP). This study is part of a larger examination of available legal mechanisms and especially policy formulation in three states of Sikkim, Tamil Nadu and Uttar Pradesh to deliver on the objectives of NWP-2012. This report in brief describes about the Tamil Nadu State Water Policy-1994 and regulatory framework existing in the State.

The Tamil Nadu Water Policy, 1994 precedes National Water Policy of 2012 and therefore some of the principles and approaches contained therein remain to be harmonized to be in tune with NWP-2012. However, the State Water Policy of Tamil Nadu-1994 acknowledges water as a scarce resource and underlines the need for its planning, development and management to be guided by state perspectives. The water allocation priorities are broadly classified as (a) Drinking Water, (b) Irrigation (c) Hydro Power (d) Industrial and other uses. Water management in the state is carried out on basis of the statutory enactments such as *The Tamil Nadu Additional Assessment and Additional Water Cess Act 1963*, *Chennai Metropolitan Area Ground Water (Regulation) Act, 1987*, *The Tamil Nadu Panchayat Act, 1994*, *The Tamil Nadu Farmers Management - Irrigation Systems Act, 2000*, *Tamil Nadu State Groundwater Development and Management Act, 2003*, *The Tamil Nadu Protection of Tanks and Eviction of Encroachment Act, 2007*. An analysis of these enactments reveals that the state is not having any regulatory framework for deciding allocation of water for competing uses as Water Regulatory Authority has not been established in the state. The State has enacted law to regulate groundwater extraction.

There is a need for revisiting Tamil Nadu Water Policy, 1994 in view of the objectives and principles enunciated in NWP, 2012. Considering impacts of climate change over water resources in the state is an emerging issue, there is no discussion of the same in the state policy whereas NWP, 2012 lays emphasis over this aspect. Added emphasis over demand side management and water use efficiency is required in the policy framework for Tamil Nadu. The navigation and ecological uses of water are not prioritised in the scheme of the policy. Climate Change impacts and adaptation strategies are required to be incorporated in planning and management of water resource projects for long-term sustainability.

Introduction and Background

Tamil Nadu is the southernmost state in the country and shares its boundary with union territory of Puducherry, states of Kerala, Karnataka, and Andhra Pradesh. Tamil Nadu is the eleventh-largest state in India by area and the sixth most populous. It is one of the

seven most developed states in the country¹ with its economy ranked second on Gross State Domestic Product (GSDP) values. The western, southern and the north western parts are hilly and rich in vegetation. Tamil Nadu is the only state in India, which has both the Western Ghat and the Eastern Ghat mountain ranges which both meet at the Nilgiri hills.²The northern parts are a mix of hills and plains. The central and the south-central regions are arid plains. The state shares maritime border with country of Sri Lanka.

Water Resources Scenario in Tamil Nadu

The state of Tamil Nadu has only 2.5 percent of India's water resources.³ It is estimated that more than 95% of the surface water and 80% of the ground water resources have already been put into use. Tamil Nadu is heavily dependent on monsoon rains, and thereby is prone to drought when the monsoon fails. The state has distinct periods of rainfall, which are the advancing monsoon period, South-west monsoon (from June to September) with strong southwest winds, the North-east monsoon (from October to December), with dominant northeast winds, and the Dry season (from January to May). The annual average rainfall is around 930 mm (47% during the northeast monsoon, 35% during the southwest monsoon, 14 % in the summer and 4 % in the winter).⁴

There are 17 river basins in the state and Cauvery being the major basin, 13 basins are medium and 3 are minor river basins. At 75% dependability, the annual surface water generated in the State is 692.78 TMC (19,619 MCM).⁵ The rivers that flow through the state are inter-state rivers and as such depends on neighbouring States for considerable quantum of flows, which is about 261.70 TMC (7411 MCM) annually.⁶

State has about 85 reservoirs- major & medium and all putting together there is total storage capacity of about 6,500 MCM. Additionally, there are about 39000 tanks and their total capacity is assessed as 6000 MCM.⁷

The ground water potential (annual) of the State is 22,943 MCM and the net annual ground water availability is 20,649 MCM. As per the recent classification, out of 385+1 blocks, 138+1 (Chennai district) are over exploited, 33 are critical, 67 are semi-critical and in 11 blocks the water quality is bad. Only 136 blocks are classified as safe.⁸

The present challenges relating to water in the state includes growing gap between supply and demand and by 2020 it is expected to be 5,211 MCM (11 %) and likely to go up to 17 % by 2050 due to over-exploitation of ground water, decreasing southwest monsoon and increasing northeast monsoon, low water use efficiency etc.

¹ RBI report 2011

² Joel Anderson. "Geography of India".Center for South Asia Outreach, University of Wisconsin-Manhattan.

³ Tamil Nadu State Action Plan for Climate Change

⁴ Tamil Nadu State Action Plan for Climate Change

⁵ Tamil Nadu State Action Plan for Climate Change

⁶ Tamil Nadu State Action Plan for Climate Change

⁷ Tamil Nadu State Action Plan for Climate Change

⁸ Central Ground water Board

Impacts of Climate Change on Water Resources in Tamil Nadu

Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as “*the degree to which a system is susceptible to, or unable to cope with, the adverse effects of climate change, including climate variability and extremes*” (IPCC 2001).

The annual precipitation is going to increase because of climate change towards the end of century but the number of rainy days is likely to decrease by half.⁹ The Annual rainfall intensities are likely to increase by 7-12 mm/day.¹⁰ The rise in sea level due to increase in global temperature will result in shifting of shorelines towards inland, thus affecting the freshwater interface in the scenario. The fresh water resources in thirteen coastal districts in the state would be affected due to seawater intrusion.

Climate change is likely to induce changes in hydro meteorological parameters like evaporation, evapo-transpiration, wind direction and wind speed etc. The changes are likely to have a direct or indirect impact on ground water resources. Area irrigated by tanks will get affected severely due to evaporation losses in the tanks, which in turn would result in over dependence on ground water. Since 1980 onwards, number of over exploited blocks has increased from 21% to 48% over a span of 30 years. This position would further intensify with climate change.¹¹

Regulatory Framework on water management

The Water Policy of Tamil Nadu, 1994 was drafted emphasising the need for utmost efficiency in water utilisation and public awareness of the importance of water conservation. The Policy underlines that “*water is a prime natural resource, a basic human need, and a precious national asset.*” Some of the objectives outlined in the policy are preservation and stabilization of existing water resources, augmentation of utilisable water resources; establish allocation priorities, maintaining water quality and promoting equity and social justice among users of water etc. Under State water policy, water allocation priorities are classified as Drinking water, Irrigation, Hydropower, Industrial and other uses.

In Tamil Nadu, water management is undertaken as per the following policy and legal instruments:

1. State Water Policy, 1994
2. Tamil Nadu District Municipalities Act, 1920
3. The Tamil Nadu Additional Assessment and Additional Water Cess Act, 1963
4. Chennai Metropolitan Area Ground Water (Regulation) Act, 1987
5. The Tamil Nadu Panchayat Act, 1994
6. The Tamil Nadu Farmers Management of Irrigation Systems Act, 2000
7. The Tamil Nadu Protection of Tanks and Eviction of Encroachment Act, 2007

⁹ Tamil Nadu State Action Plan for Climate Change

¹⁰ Tamil Nadu State Action Plan for Climate Change

¹¹ Tamil Nadu State Action Plan for Climate Change

Institutional, and Organisational set-up on water management

Sl. No	Name of the Organisation/Institution	Functions assigned
State Level Organisation/Institution		
1.	Water Resources Department (WRD)	This department is responsible for planning, evolving, executing and maintaining the irrigation facilities and infrastructure of the State. Regulation of water from dams, flood control and mitigation, coastal protection, ground water recharge, rainwater harvesting and inter-linking of rivers to divert surplus flood flows to drought prone areas are the main activities of this department. It is also executing and maintaining all Irrigation Projects such as dams, canals, tanks, water harvesting structures, implementation and maintenance of water supply in rural areas. The ground water wing of this department is maintaining all weather stations owned by the department and is monitoring the ground water level and quality of water in the State.
2.	Municipal Administration and Water Supply Department	The department is responsible for the development of urban areas in the State and ensuring provision of water supply to all the areas of the State. The Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) and Tamil Nadu Water Supply and Drainage Board (TWAD Board) are responsible for the provision of Water Supply and Underground Sewerage facilities. The department has launched a "Sustainable Water Security Mission" (2015 - 2016), which aims at campus rainwater harvesting, storm water harvesting, and renovation of water bodies with community involvement and recycle and reuse of grey water.
3.	Urban Development and Housing Department	The department is in charge of formulation and execution of policies for housing and sustained urban development keeping in view the changing socio-economic scenario of urban areas. The Tamil Nadu Housing Board, Tamil Nadu Slum Clearance Board, Registrar of Co-operative Societies (Housing), Directorate of Town & Country Planning and Chennai Metropolitan Development Authority are under the administrative control of this department. The tenements constructed by Tamil Nadu

		Slum Clearance Board (TNSCB) are upgraded by carrying out Repairs, Renewal works like water supply, and sanitary lines, water closets etc. and colour wash to improve the living condition in the tenements.
4.	Department of Environment and Pollution Control	The Department is entrusted with pollution abatement in the rivers of -Kaveri, Vaigai and Thamirabarani and in the waterways of Chennai City. The National Lake Conservation Programme, Management of Coastal Regulation Zone and all other significant environment protection efforts are the responsibility of the department along with implementation of legislations such as Water (Prevention and Control of Pollution) Act, 1974 and The Water (Prevention and Control of Pollution) Cess Act, Rules, 1977-78.
5.	Department of Forests	The department is to preserve wetlands, water bodies, Rivers, Check dams and other man made water structures to enhance major water production landscapes. Increasing forest cover has a right effect over enhancing watersheds that act as sources of water in the state.
6.	TWAD (Tamil Nadu Water Supply and Drainage Board)	It was formed in 1971 as an autonomous organization for providing water supply and drainage facilities to Rural and Urban areas of the state excluding the Chennai Metropolitan Area. The functions of the Board includes planning, investigation, design, implementation and commissioning of water supply and sewerage schemes in rural and urban areas, water quality monitoring and surveillance programme.
7.	Chennai Metropolitan Water Supply and Sewerage Board	In 1978, this Board was formed to augment water supply in the city. Some of the functions of the Board includes promoting and securing the planned development of water supply and sewerage services, efficient operation, maintenance and regulation of these systems, controlling extraction, conservation and use of ground water in Chennai Metropolitan Area, preventing pollution of any water including any water sources, water course or channel utilized for the purpose of Chennai Metropolitan Area.
8.	Rural Development and Panchayat Raj Department	This Department is responsible for the implementation of various rural welfare schemes and assists Panchayat Raj Institutions to discharge their duties and functions as

		effective Local Self Government entities. This department is maintaining minor Irrigation tanks in the State.
9.	Tamil Nadu Pollution Control Board (TNPCB)	The objective of TNPCB is to control, prevent and abate pollution of streams, wells, land and atmosphere in the State and to protect the environment from any degradation by effective monitoring and implementation of pollution control legislations.
10.	Directorate of Commerce and Industries	It has Micro Small and Medium Enterprises Department under it and formulates schemes for the development of the sector. This department establishes Industrial estates for setting up MSME units. It is the responsibility of the department to provide basic infrastructural facilities such as water supply, roads etc. Therefore, the department has to work in close conjunction with Tamil Nadu Water Supply and Drainage Board for supply of water.
11.	Animal Husbandry, Dairying and Fisheries Department	Animal Husbandry, Dairying and Fisheries Department is of immense importance given that Tamil Nadu is a coastal state. Fishery resources of Tamil Nadu are categorised as Marine, Inland and Brackish water. Tamil Nadu possesses 3.83 lakh ha of effective inland water resources comprising of reservoirs, major irrigation tanks, minor irrigation tanks and short seasonal tanks and ponds, rivers, backwaters and derelict water bodies. There is burgeoning shrimp cultivation taking place along the coast. The fisheries potential is directly linked to water availability in the state.

Assessment of Institutional and Regulatory Framework qua National Water Policy, 2012

The institutional and regulatory preparedness of the state as per thematic areas presented in National Water Policy-2012 (NWP) is given below:

	Thematic Areas as per NWP	What is to be explored	(Status based on research)
1.	Public Policy on water resources to be informed of basic common principles	a. Whether state has a water policy	State has a Water Policy of Tamil Nadu, 1994.
		b. Whether the state water policy is updated in view of NWP-2012?	As the existing State Water policy is of 1994 vintage it is not updated in view of NWP-2012
		c. Whether the sentiment articulated in NWP is echoed in state policies?	The existing State Water policy is of 1994 vintage and is not articulating principles enunciated in NWP-2012
		d. Is there any concrete action taken to revise the State policy in line with NWP-2012?	There are efforts to revise ¹² the state water policy in view of the mandate of NWP-2012

¹²<http://www.deccanherald.com/content/425158/tamil-nadu-has-no-control.html>

2.	Raising Awareness about criticality of water as a natural resource	a. Does water policy of the state say anything about water being a scarce, natural resource?	The Water Policy of Tamil Nadu states regarding the scarcity of water resource.
		b. Does the state have a campaign running or any engagement with its citizens to create and foster this sentiment?	Yes, there is a state wide awareness campaign on this aspect.
3.	Water quality and quantity	a. Does the state water policy include a provision on right to access to minimum quantity of potable water for health and hygiene?	There is no specific provision in the Water Policy of Tamil Nadu, 1994 on right to access to minimum quantity of potable water for health and hygiene.
		b. Is there any law to guarantee this?	There is no law to guarantee this aspect.

		<p>c. Does the State Water Policy contain an article or a position which places responsibility on citizens about protection and conservation of water sources in their immediate vicinity?</p>	<p>The Water Policy of Tamil Nadu, 1994 is not having a provision placing responsibility on citizens about protection and conservation of water sources.</p>
		<p>d. Is the institutional mechanism geared up to deliver this?</p>	<p>The Water Policy of Tamil Nadu, 1994 lays emphasis upon monitoring water quality of surface and ground water. A phased programme to be undertaken for improvements in water quality. In order to maintain water quality there is a need to step towards recycling and re-use of water.</p>
		<p>e. Does the state provide the rights or powers to the Panchayati Raj Institutions, or citizens to independently initiate actions for protection and conservation of water sources in their immediate vicinity (article 48(a)(g) and 58 (a) of the Indian constitution specifically referred to these responsibilities</p>	<p>It is the duty of the Village Panchayat as per <i>Tamil Nadu Panchayat act 1994</i> to repair and maintain the ponds and tanks for construction and maintenance of water works for washing and bathing uses.¹³</p>

¹³ Section 110 (g) Tamil Nadu Panchayat act 1994

		related to water, and other natural resources)?	
4.	Maintaining and sustaining Ecological needs and flows in a river	a. Is there any law or policy in the state which makes it mandatory to undertake a scientific study to determine the ecological requirement of water for a river?	There is no law or policy mandating undertaking of a scientific study to determine the ecological requirement of water for a river.
		b. If yes what is the implementation and monitoring of the same?	Not applicable in view of above
5.	Adaptation to climate change	a. Has the state formulated State Action Plan for Climate Change and has the concerns regarding effect of climate change on water resources been integrated into these plans. Are there District Level Climate Change Action Plans being formulated within the regulatory framework	State has formulated its Action Plan for Climate Change. The effect of climate change on existing water resources have been integrated in the state plan. The District Level Climate Change Action Plans have not been formulated yet.

		<p>b. Has the state begun to integrate the concerns of climate variability in to water resource management and planning</p>	<p>The State Level Climate Change Action Plan incorporates scenarios of climate variability and outlines strategies to counter it.</p>
		<p>c. Is there any special impetus to increasing water storage capacity?</p>	<p>The state has distinct three typical regions that require specific interventions as per their physiographic features in the hilly areas. Water storage capacity would be increased by repairing, renovating and restoring existing water bodies. In the plains interventions range from increasing reservoir storage potential of existing irrigation projects in the region. This can be done through desilting reservoirs, blocking leakages and lining of canal systems. Further, feasibility of transferring water from surplus basin to deficit basin can be explored and analysed. The Water Policy of Tamil Nadu, 1994 underlines the need for increasing storage capacities of tanks through various interventions such as desilting-cum-reclamation, removal of encroachments around the tanks.¹⁴</p>
		<p>d. Whether there is any provision to increase water use efficiency across all water using groups, agriculture, domestic, commercial and industrial?</p>	<p>The State Level Action Plan on Climate Change places emphasis upon sectoral water use efficiency.</p>

¹⁴ Explanatory version of State water policy vide G.O Ms. No.716 Public works Department dated 13.7.94

		<p>e. Are sustainable agricultural practices being adopted & reshaped as per the water availability in Tamil Nadu or its region?</p>	<p>The Water Policy of Tamil Nadu, 1994 outlines measures such as water zoning, water budgeting by choosing the right cropping pattern, fixing crop calendar and method of irrigation. The State Action Plan for Climate Change underlines water conservation strategies for agriculture including research on conjunctive use of irrigation water, increase the use of micro irrigation technology viz., drip, sprinkler, Rain gun, mobile sprinkler in dry land, garden land and horticultural farming system, strengthening existing water harvesting structures and repairing and replacing the shutters in the irrigation tanks and drainage channels, creation of additional farm ponds to capture the runoff water and utilise the harvested water to critical stages of crop growth and to recharge the aquifers to improve the quality of irrigation water.¹⁵</p>
		<p>f. Is climate change variability included as criteria for water development projects?</p>	<p>Yes, Climate change variability is included as criteria for water development projects.</p>
		<p>g. Are stakeholders being involved inland-soil-water management planning for evolving different agricultural strategies, reducing soil erosion and improving soil fertility</p>	<p>One of strategies to enhance Water Use Efficiency in the State Action Plan for Climate Change is through renovating the existing systems and by educating farmers to adopt modern irrigation methods and latest technologies. Participatory approach i.e., stakeholders' involvement is to be encouraged in planning, development, utilization and management of water resources.</p>
6.	Augmenting water Supply and sanitation	<p>a. Is the State doing any of the following to augmenting water supply and provide access to sanitation&</p>	<p>The Tamil Nadu Housing Board is developing schemes with underground sewer system with treatment plant in rural / non-urban area and the effluent from treatment plant is to be disposed through dispersion trench and final disposal is to the existing <i>nulla/odai</i>. It is</p>

¹⁵Tamil Nadu State Action Plan for Climate Change

		<p>made recycling and reuse mandatory</p>	<p>proposed to recycle the treated sewage water and use it for gardening / planting trees for conservation of water, instead of disposal of the effluent from treated plant to the existing <i>odai</i>.¹⁶</p> <p>One of the strategies to prevent salt water intrusion in coastal areas is to undertake artificial recharge of wells to secure water availability and locally capture surface water runoff into derelict wells to restore groundwater levels and engineer infiltration with recycled wastewater.</p> <p>Reuse of secondary treated sewage is being promoted for non-potable uses.. About 3.00 lakh litres per day of secondary treated sewage is supplied to the Chennai Municipal Corporation for watering of plants and lawns at public parks and traffic islands.</p>
		<p>b. Is Rain water harvesting made mandatory in the State?</p>	<p>Through an ordinance titled Tamil Nadu Municipal Laws Ordinance, 2003, dated July 19, 2003, the Government has made rainwater harvesting mandatory for all the buildings, both public and private, in the state. The deadline to construct rainwater harvesting structures was August 31, 2003. Municipal Administration and Water Supply (WS1) Department through a Government Order dated Nov. 2002, assigned Municipal Administration and Water Supply Department as the Nodal Departments for Rain Water Harvesting(RWH), proposed setting up of State level and District Level Coordination Committees and propagated RWH in Government Buildings. It made it mandatory for Chennai Metropolitan Development Authority, all MCs, Municipalities, etc to sanction building plans only after implementation of RWH. Water and sewer connection would not be given to new buildings without RWH.</p> <ul style="list-style-type: none"> • Notification to Municipal Administration and Water Supply Department dated October 2002 for Provision of Water Conservation Measures, Amendments to Chennai city

¹⁶Tamil Nadu State Action Plan for Climate Change

			<p>Corporation Building Rules, 1972 and Special Rules for the Multi storeyed and Public Buildings, 1974, Tamil Nadu Municipal Corporation of Madurai, Madurai Municipal Corporation Building (Water Conservation) Rules, 2002.</p> <ul style="list-style-type: none"> • Government of Tamil Nadu published a notification in the Tamil Nadu Gazette to make amendments to Chennai City Municipal Corporation Act 1919, Tamil Nadu District Municipalities Act 1920,¹⁷ Madurai City Municipal Corporation 1971 and Coimbatore City Municipal Corporation Act 1981 to make RWH mandatory. Under these amendments. RWH was also made mandatory for all Government buildings • RWH has been made mandatory in three storied buildings irrespective of the size of rooftop area.
		c. Desalination techniques	<p>The water supply infrastructure installations include the 100 MLD desalination plant at Kattupalli, the 100 MLD desalination plant at Nemmeli, the desalination plant at Naripaiyur.</p> <p>One of the strategy to avert enhanced salt water intrusion in the ground water and ensure water security in coastal areas is to identify areas where ground water has become saline and salinity is likely to increase with climate change and in such areas establish desalination plants.¹⁸ Desalination plants in coastal areas are to be established to ensure availability of fresh water.</p>
		d. Made water use efficiency mandatory	<p>Water Use Efficiency (WUE) has not been made mandatory by way of a regulatory process in Tamil Nadu. However, a few pilot projects have been launched in the state for promoting WUE in the agricultural sector. Thus for example, the Tamil Nadu State Land Use Board has funded a project on 'maximising land and water use efficiency through micro water</p>

¹⁷ Inserted Section 215-A to Tamil Nadu District Municipalities Act, 1920 by Tamil Nadu Municipal Laws (Second Amendment) Act, 2004

¹⁸ Tamil Nadu State Action Plan for Climate Change

		<p>harvesting techniques in dry land horticulture system¹⁹. No dedicated policy or regulatory provision exists for ensuring WUE in all sectors of water use. At the city level and in the context of urban water use efficiency, the Chennai Metropolitan Water Supply and Sewerage Act, 1978 provides that the board that shall perform the function of planned development, efficient operation, maintenance and regulation of water supply and sewerage system in the Chennai Metropolitan Area²⁰.</p>
	e. Are there subsidies and incentives for recovery of industrial pollutants and recycling / reuse	<p>There are no state wide subsidies and incentives. However, at the city level the Chennai Metropolitan Water Supply and Sewerage Act, 1978 empowers the Board constituted under it to prepare schemes for water supply and sewerage (including abstraction of water from any natural resource and the disposal of waste and any natural water) in or for the Chennai Metropolitan area²¹.</p>
	f. Are sewerage charges being put/recovered in urban areas	<p>The Chennai Metropolitan Water Supply and Sewerage Service Charges (Levy and Collection) Regulations 1998 framed under Chennai Metropolitan Water Supply and Sewerage Act 1978 deals with levy and collection of water supply and sewerage service charges.</p>
	g. What steps are undertaken to augment rural water supply?	<p>The task of providing safe drinking water and sanitation facilities for the rural areas in the State is the responsibility of the Department of Rural Development & Panchayati Raj and Tamil Nadu Water Supply & Drainage Board (TWAD). The activities of the TWAD Board include Planning, Investigation, Design Implementation and Commissioning of Water Supply and Sewerage Schemes in rural and urban areas, operation and maintenance of Combined Water Supply Schemes, Water Quality Monitoring and Surveillance Programme. In the urban areas the efforts to augment water supply have been incorporated in the Master Plans at the city level, for example,</p>

¹⁹http://www.spc.tn.gov.in/SLUB_STUDIES_PDF/Study_29.pdf

²⁰ Section 5(1)(a) of the Chennai Metropolitan Water Supply and Sewerage Act 1978

²¹ Section 6 (2)(iii), ibid

			Chennai Second Master Plan and the Chennai revised City Development Plan ²² .
7.	Ground water use and management	a. Has the Tamil Nadu State done Aquifer mapping to know the quality and quantity of ground water.	The state had enacted Tamil Nadu Groundwater (Development and Management) Act, 2003 which had provision for scientific management of groundwater resources in the state. The Act has however been repealed ²³ . The Act was repealed to enact a comprehensive law to develop and manage the groundwater. The state has established State Ground and Surface Water Resources Data Centre.
		b. Does the state have a ground water law	No. The state had enacted the groundwater law in 2003 but the same was repealed. Tamil Nadu Groundwater (Development and Management) Act, 2003 was not applicable to Chennai and 302 revenue villages of the neighbouring Kancheepuram and Tiruvallur districts, all of which are covered under Chennai Metropolitan Area Groundwater (Regulation) Act, 1987 governing groundwater extraction in these areas.
		c. Is there a authority mandated to manage and conserve groundwater	The state of Tamil Nadu has State Ground and Surface Water Resources Data Centre. There is no regulatory authority though. The CGWA established by the Supreme Court does not regulate the use and abstraction of groundwater in the state ²⁴ . The “competent authority” under Chennai Metropolitan Area Groundwater (Regulation) Act, 1987 has mandate to conserve and manage groundwater while granting “permit” and “license” for extraction of groundwater.
		d. Does the law protect over exploited aquifers, how?	No dedicated ground water law in place in the state except for Chennai city and 302 revenue villages of the neighbouring Kancheepuram and Tiruvallur districts which are covered under Chennai Metropolitan Area Groundwater (Regulation) Act, 1987 governing groundwater extraction in these areas.

²²http://www.spc.tn.gov.in//12plan_english/6.%20WATER_SUPPLY.pdf

²³ Tamil Nadu Ordinance No. 4 OF 2013.

²⁴<http://cgwa-noc.gov.in/LandingPage/GroundWater.htm>

		e. Is extraction of ground water linked with recharge of the same?	The Chennai Metropolitan Area Groundwater (Regulation) Act, 1987 as amended by Chennai Metropolitan Area Groundwater (Regulation) Amendment Act, 2002 mandates that before grant of license for extraction of groundwater various factors are required to be taken into account including the measures taken for conservation of groundwater and harvesting of rain water ²⁵ for recharge of groundwater.
8. Integrated Watershed development		a. Whether the State has take-up specific steps to ensure integrated watershed development.	The state has established an institutional mechanism for the Integrated Watershed Development. Tamil Nadu Watershed Development Agency (TAWDEVA) was established in 2002 and registered under Society Registration Act 1975 with Head quarters at Chennai. This agency is functioning under the administrative control of State Government of Agriculture as an independent and autonomous authority vested with full executive and financial powers. The primary objective is to develop the wasteland programmes, and subsequently the watershed development programmes like National Watershed Development Project for Rainfed Areas (NWDPR), Watershed Development Fund (WDF) and Integrated Watershed Management Programme (IWMP) funded by various Ministries are implemented by this agency.
		b. Have statutory / administrative / departmental steps been taken in order to integrate / align the objective functions which may differ	The state has established an institutional mechanism for the achieving the above objective by the Tamil Nadu Watershed Development Agency (TAWDEVA)
		c. Are water sources and their catchment areas being looked at in totality?	The water sources and their catchment areas are not being looked at in totality, though there are measures to map them in developmental plans.

²⁵ Section 5

		d. Have steps been taken to avoid duplication of overhead costs in order to create synergies	The steps are required to be taken in this direction to ensure proper water management.
		e. Are developmental laws harmonised with the need of integrated watershed development.	No. In fact the key subject matter legislation i.e. the state ground water law has been repealed though Chennai Metropolitan Area Groundwater (Regulation) Act, 1987 is in existence
		f. Have other development related laws been amended or harmonized in order to avoid contradictions (e.g. The Indian Easement Act 1882 and the confusion regarding ownership of groundwater, and / or surface water)	No.
9.	Demand Management and Water use efficiency	a. Is there any specific law mandating quantum of water for a particular use i.e. benchmarking of water usage for different users in industrial water usage	There is no such law in place.

		<p>b. Is there any penalty for wastage of water and incentive for water use efficiency</p>	<p>The Chennai Metropolitan Water Supply and Sewerage Act, 1978 has a provision for prevention of wastage of water²⁶ and the “authorised authority” has the power to cut off water supply²⁷ to stop wastage of water in the Chennai Metropolitan Area.</p>
		<p>c. Is there any efficiency benchmark at which irrigation projects have to perform and function</p>	<p>Pilot projects are in place as has been mentioned above. However benchmarking by way of a regulation has not been done.</p>
		<p>d. What are the existing schemes providing incentives for engaging in cropping pattern using micro irrigation (drip, sprinkler, etc.), automated irrigation operation, evaporation-transpiration reduction, etc.</p>	<p>There are a number of central and state level schemes that are being implemented by the state. Integrated Watershed Management Programme (IWMP). The watershed Development Programmes under IWMP 2009-10 is being implemented in 24 districts from 2009-10 onwards. Drought Prone Areas Programme (DPAP). Integrated Wasteland Development Programme (IWDP). Integrated Wasteland Development Programme aims at tackling the non-forest wasteland in non-DPAP blocks. The basic aim of the programme is to harvest the rainwater and to bring the degraded lands into productive use. National Watershed Development Project for Rainfed Areas (NWDPA) is being implemented in Tamil Nadu from VIII Five Year Plan (1990 - 91) onwards. The National Agricultural Development Programme - Rashtriya Krishi Vikas Yojana (NADP- RKVY) has been launched to achieve 4% annual growth rate in agricultural sector. The objective of the scheme is to promote participation of farmers in cluster mode in agriculture, reducing yield gap in key crops through focused interventions, maximize returns to the farmers and bringing quantifiable changes in the production and productivity of agriculture and allied sectors.</p>

²⁶ Section 48- Prevention of wastage of water- 1. No owner or occupier of any premises to which water is supplied by the Board shall negligently or otherwise suffer such water to be wasted or shall suffer pipes, taps, works and fittings for the supply of water to remain out of repair so as to cause wastage of water.

2. No person shall cause wastage of water provided by the Board by the misuse of public stand-posts or pipes, drinking fountains or hydrants.

²⁷ Section 49- Power to cut off water supply- e. if any pipes, taps, works or fittings connected with the supply of water to the premises be found on examination to be out of repair to such an extent as to cause such wastage of water that immediate prevention is necessary.

		f. Is there any scheme being used in the state which encourages people to use water use efficient gadgets	None. Except the mandatory provisions of Rainwater harvesting.
		g. Is there a mechanism to conduct water audits –voluntary or mandatory	No.
10	Water pricing	a. Is there a mechanism for water pricing in the State?	Tamil Nadu Water Supply and Drainage Board is the nodal agency for water pricing in the state. The Board issues Government Orders (GOs) for fixing the water price for the rural and urban local bodies as well as industries ²⁸ .
		b. Has Water Regulatory Authority been established	No such authority has been established in the State.
		c. What is the water pricing methods being followed?	The Tamil Nadu Water Supply and Drainage Board is executing a number of Water Supply schemes to the local bodies. The board seems to consider a number of factors while arriving at a decision with respect to water pricing by adopting GOs to that effect. For example rise in electricity charges are being factored into water pricing in the state. Thus for example in the year 2002, the increase in water tariff due to increase in electrical energy turned out to be Rs. 0.79 per 1000 litres. The Tamil Nadu Water Supply and Drainage Board, for example in that year had resolved to approve the tariff and recommended to the same to the Government accordingly.
		d. Has water pricing been rationalised? If yes how? If no why?	A multi-criteria decision framework is being used for water pricing in the state. But whether it has been rationalized could not be clearly revealed from the research.

²⁸<http://www.twadboard.gov.in/twad/tariff.aspx>

		e. Are water charges being recovered from the consumers?	Yes. The Board recovers the water charges on a regular basis.
		f. Are Water Users Associations (WUAs) involved in the process of fixing rates of water?	The Farmers Management of Irrigation systems Act, 2000 provides for the delineation of WUAs area. The Act envisages the WUAs to assist the authorities of the Revenue department, in the preparation of demand and collection of water charges ²⁹ .
		g. Are Water Users Associations (WUAs) given statutory powers to collect and retain a portion of water charges, manage the volumetric quantum of water allotted to them and to maintain the distribution system in their jurisdiction?	As per the Farmers Management of Irrigation systems Act, 2000 WUAs are required to assist the authorities of the Revenue department of the Government, in the preparation of demand and collection of water charges ³⁰ . They also carry out an important function of regulating the use of water among the various sluices under its area of operation according to the Rotational Water Supply; to prepare and maintain an inventory of the irrigation system within the area of operation and to monitor flow of water for irrigation, among many other important functions.
11	Scientific assessment of water resources and Database, information system.	a. Which are the Institutions involved in the scientific assessment of the water resources	The State has established a Data base management centre by the name State Ground And Surface Water Resources Data Centre for scientific assessment of the water resources
		b. How is the state is organising its hydrological database	The state seems to have a well-organized data management on its website ³¹ .
		c. Which institutions and regulatory bodies are involved in the collection of Data	The water resources department of the state is involved in data collection and management ³² .

²⁹ Section 22 (e), The Farmers Management of Irrigation systems Act, 2000

³⁰ Section 22 (e), The Farmers Management of Irrigation systems Act, 2000

³¹ <http://www.groundwatertnpwd.org.in/indexnew.htm>

³² Subject to further research and clarifications.

		d. What are the different types of Data being collected at the state level?	Rainfall Data – Yearly, Monthly, Daily, Hourly, Meteorological Data, Hydrologic Data (Discharge at various points of the river), Ground Water Level data, Water Quality for GW & SW, Geological Data-Lithologs, Sea water Intrusion data, Well Census Data – Database of wells throughout Tamil Nadu
12	Allocation and uses of water	a. Is there a mechanism for water allocation amongst different competing uses?	The Water Policy of Tamil Nadu, 1994 provides for the allocation of water use in the state. It mentions that the State shall establish allocation priorities for water use by different sectors with provision of drinking water of highest priority. The Policy also has a provision for providing adequate water for industry.
		b. If yes, what are the criteria and principles followed for allocation?	For doing so that the Institute of water studies (IWS), Public Works Department will prepare water balance studies and prepare macro level basin plans and assist the Water Resources Control and Review Council (WRCRC) in allocating water for different sector users keeping the objective in mind.
		c. Are principles of equity and social justice being followed for water allocation	Yes. One of the important objectives of the Water Policy of Tamil Nadu, 1994 is to promote equity and social justice among users of water from across the sectors.
		d. What are the existing mechanism for dispute resolution in allocation of water	Various institutions at the level of governance such as local bodies and tank level organizations work as dispute resolution mechanism in the state.
		e. Have the water uses have been prioritized, and has the basic needs principle been adopted; e.g. Reservation of water for drinking (inclusive of cattle) and domestic purposes	Yes. Water Allocation are prioritised as firstly, drinking secondly, irrigation, thirdly, hydropower and fourthly, for industrial and other uses

		f. Has the state policy defines the procedure of allocation of scare water between sectors? e.g. Drinking and domestic, agriculture, industry, Hydro-power etc, in order to achieve optimal use	Yes. The policy defines that domestic water would be given the highest priority based on the principle of equity and social justice.
		g. Between the principle of satisfying basic needs and the principle of ability to pay (pricing), which one will be given preference and / or priority?	The Water Policy of Tamil Nadu, 1994 states that one of the key objectives is to plan for economic and financial sustainability based upon the principle that those who benefit from projects and programs should also pay for them.
13	Management Of Flood & Drought	a. What is the regulatory mechanism to prevent loss of land eroded by the river, which causes permanent loss, revetments, spurs, embankments, etc.,	Tamil Nadu has a State Disaster Management Authority. The State Disaster Management Policy was prepared in 2003. According Disaster Management Authority and plans at the district level have also been formulated.
		b. Is there an institutional setup for flood forecasting using real time data acquisition system and linked to forecasting models?	Yes. Tamil Nadu has a State Disaster Management Authority that carries out the regular data monitoring and sharing in coordination with other state and district level agencies.
14	Integrated Water Resources Management	a. Has the state incorporated river basin / sub-basin as a unit as the main principle for planning, development and management of Water resources.	The 1994 Policy provides that river basin will be the unit for planning. Smaller basins can be grouped together for administrative purposes.
		b. Is there river basin management authority established by the state government	There are no river basin management authorities established by the state government.

		c. What are the functions and powers of the river basin management authorities	There are no river basin management authorities established by the state government.
15	Planning and Implementation of water resource projects	a. What is the level of participation of local governing bodies like Panchayats, Municipalities, Corporations, etc., and Water Users Associations, in planning of Water resource projects.	In Tamil Nadu local governments play an active role at the municipal level, village level for the management of water resources in their jurisdiction.
		b. Are the needs and aspirations of the Scheduled caste and Scheduled Tribes, women and other weaker sections of the society being taken into consideration in the planning process	No
		c. Is there an institutional mechanism in the form of a single window clearance for all clearances, including environmental and investment clearances, required for implementation of projects to avoid the economic losses	There is no single window clearance for water resources projects, though Tamil Nadu Industrial Guidance and Export Promotion Bureau (Guidance Bureau) was set up as the Nodal Agency for industrial investment promotion and single window facilitation.
16	Conservation of river corridors, water bodies and wetlands	a. What is the prevalent institutional structure for conservation and management of river corridors, water bodies, wetlands within the state?	The State has constituted Tamil Nadu Wetland Authority ³³ which is headed by Chief Secretary. It will identify and select priority wetlands based upon scientific criteria for consideration of Central wetlands Regulatory Authority. It will also finalise and approve management plan of the selected wetland. It will 'guide' and 'monitor' constitution of District Wetland Management Committee.

³³ G.O Ms. No. 55, Environment and Forests (FR5) department dated 23.05.2016

			The Tamil Nadu Protection of Tanks and Eviction of Encroachment Act, 2007 provides framework of measures for checking the encroachment, eviction of encroachment in tanks ³⁴ under the control and management of Public Works Department.
		b. Is there community participation in the conservation of river corridors, water bodies, wetlands?	Under the disaster management projects in Coastal areas community participation is encouraged. Panchayats also play a crucial role in mobilizing communities for the conservation of water bodies. The Tamil Nadu Wetland Authority if it deems it necessary can involve the community in conservation and preservation of wetlands in the state. Such measures can be included in the management plan of the wetland.
		c. What are the institutional and regulatory measures to deal with encroachments and diversion of water bodies, wetlands in rural and urban areas?	A management plan is to be prepared for every selected wetland, which is to be approved by the Tamil Nadu Wetland Authority. This management plan is to be then approved by the Central Wetland Regulatory Authority.
		d. Besides participation, has the community or an individual being given the right (duty and responsibility) to protect and conserve water sources?	Not by way of a legal provision. Local level institutions are entrusted with the task.

³⁴ Section 2 (l) Tank means "(l) 'tank' means a storage structure built in for harnessing water for use and includes supply channel and its cross masonries, tank sluice, surplus weir, surplus course and its cross masonries; field channel and its cross masonries besides the drains and tank poramboke lands which are under the control and management of Public Works Department;

Whether present institutional and regulatory framework is adequate to implement the National Water Policy-2012?

- **Need for revisiting the Tamil Nadu Water Policy, 1994:** The Water Policy of Tamil Nadu, 1994, needs to be revisited in terms of the NWP, 2012, as the basic principles require reflection at the state level. Considering that impacts of climate change over water resources in the state is an emerging issue, there is no discussion of the same in the state policy whereas NWP, 2012 lays emphasis over this aspect.
- **Setting up an independent statutory Water Regulatory Authority:** The Water Policy of Tamil Nadu-1994 is silent over the regulatory framework to manage water resources, its allocation, entitlements and tariff fixation among users. The Water Policy of Tamil Nadu discusses the need for water augmentation, conservation and efficient use, but there is no system in place to implement the measures required for the same. One of the measures in NWP, 2012 to achieve pricing of water and its equitable access is setting up of independent statutory Water Regulatory Authority by state. The key function of water regulatory authority is to fix and regulate the water tariff system based on principles of cost recovery and reducing subsidies and determination of entitlements, which involves the allotment of certain shares of water to various water users or group of users.
- **Enhancing Water Use Efficiency through River Basin and Project Planning:** River Basin planning to incorporate water use efficiency is the need of the hour though it is not addressed in detail in the Water Policy of Tamil Nadu, though there is mention that planning should be at the basin level. It neither discusses measures to evolve benchmarks for water uses for different purposes, i.e., water footprints, and water auditing a way of promoting efficient use of water. An institutional arrangement for evolving mechanisms for efficient water use at basin/sub-basin level needs to be established for achieving the objectives of the NWP, 2012.
- **Inclusion of Climate Change Adaptation strategies in water planning processes:** There is absence of discussion on climate change impacts or adaptation in Water Policy of Tamil Nadu regarding water resources, whereas climate change adaptation is one of the major issues dealt in NWP, 2012. The climate change impacts on water resources of the state are well documented and various studies are underway to assess adaptation strategies, given this focus it is important for the state water policy to address this aspect.
- **Development of Navigational uses of Rivers and water bodies:** The NWP, 2012 lays emphasis on development of rivers and water bodies for navigational

uses and its inclusion in the planning process from inception phase. Neither the Water Policy of Tamil Nadu discusses navigation potential of the rivers nor finds mention in the water allocation priorities of the state. In this aspect, Water Policy of Tamil Nadu requires to be updated to include aspects on navigation.

- **Enhancing sectoral water use efficiency:** The NWP, 2012 lays great emphasis on demand side management and water use efficiency for various sectors as a measure to ensure sustainable and efficient way of using water. The Water Policy of Tamil Nadu is silent on demand side management of water, which is a way forward to ensure availability of water for different competing uses.
- **Expanding allocation priorities:** The Water Policy of Tamil Nadu, 1994 does not prioritise allocation of water for ecological needs, which are of tremendous importance given the sustained impacts of climate change. NWP, 2012 lays emphasis over allocation of water for ecological needs in addition to allocation of water for drinking, irrigation, hydropower etc.