





Centre for Ganga River Basin Management and Studies

March 2025

# PERIYAR RIVER ATLAS

March 2025



Centres for Periyar River Basin Management Studies

IIT Palakkad & NIT Calicut



Centre for Ganga River Basin Management and Studies

#### **National River Conservation Directorate (NRCD)**

The National River Conservation Directorate, functioning under the Department of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Jal Shakti providing financial assistance to the State Government for conservation of rivers under the Centrally Sponsored Schemes of 'National River Conservation Plan (NRCP)'. National River Conservation Plan to the State Governments/ local bodies to set up infrastructure for pollution abatement of rivers in identified polluted river stretches based on proposals received from the State Governments/ local bodies.

#### www.nrcd.nic.in

#### **Centre for Periyar River Basin Management and Studies (cPeriyar)**

The Centre for Periyar River Basin Management and Studies (cPeriyar) is a Brain Trust dedicated to River Science and River Basin Management. Established in 2024 by IIT Palakkad and NIT Calicut, under the supervision of cGanga at IIT Kanpur, the center serves as a knowledge wing of the National River Conservation Directorate (NRCD). cPeriyar is committed to restoring and conserving the Periyar River and its resources through the collation of information and knowledge, research and development, planning, monitoring, education, advocacy, and stakeholder engagement.

#### www.cPeriyar.org

#### Centre for Ganga River Basin Management and Studies (cGanga)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this, it is also responsible for introducing new technologies, innovations, and solutions into India.

#### www.cganga.org

#### Acknowledgment

This report is a comprehensive outcome of the project jointly executed by IIT Palakkad (Lead Institute) and NIT Calicut (Fellow Institute) under the supervision of cGanga at IIT Kanpur. It was submitted to the National River Conservation Directorate (NRCD) in 2025. We gratefully acknowledge the individuals who provided information for this report.

#### **Suggested Citation**

Periyar River Atlas by cPeriyar and NRCD

#### **Contacts**

#### Centres for Periyar River Basin Management Studies, cPeriyar

Indian Institute of Technology Palakkad, Kanjikode 678623, Kerala, India

#### **Team Members**

Dr Athira P, cPeriyar, IIT Palakkad Dr Neenu K, cPeriyar, IIT Palakkad Majesty George, cPeriyar, IIT Palakkad K G Yadhukrishna, cPeriyar, IIT Palakkad Saivinayak Viswanathan, cPeriyar, IIT Palakkad Akhil Ridhi Ravi, cPeriyar, IIT Palakkad Dr Santhosh G Thampi, cPeriyar, NIT Calicut Dr Sathish Kumar D, cPeriyar, NIT Calicut Dr Pramada S K, cPeriyar, NIT Calicut Fathima Jamsheeena P, cPeriyar, NIT Calicut Anand V, cPeriyar, NIT Calicut Mridul K, cPeriyar, NIT Calicut Jishnu M, cPeriyar, NIT Calicut



## **PREFACE**

In an era of accelerating environmental change, understanding and protecting our rivers has become more crucial than ever. The Periyar River often referred to as "Lifeline of Kerala", sustains diverse ecosystems, countless communities, and plays a pivotal role in the ecological and economic fabric of the state.

The Centre for Periyar River Basin Management and Studies (cPeriyar), established in 2024 by IIT Palakkad and NIT Calicut, under the supervision of cGanga at IIT Kanpur, serves as a knowledge wing for the National River Conservation Directorate (NRCD), Ministry of Jal Shakti, Government of India. This initiative is aligned with the national mission to apply basin-level approaches in river rejuvenation and natural resource management. The Centre for Periyar River Basin Management Studies (cPeriyar), has prepared this River Atlas to offer a scientific and comprehensive perspective of the Periyar River Basin.

Periyar River Atlas presents an original and systematic mapping of the Periyar River network and its Sub-basins. This atlas represents a dedicated effort to trace, map, and compile the interconnected web of rivers, tributaries, and streams within the basin. The document brings together insights from scientific assessments, field observations, and data compiled from various governmental and institutional sources. This compilation serves as a valuable resource for Central, State, and local agencies involved in water resource management, environmental conservation, and basin planning in the region, as many of the river names, courses, and hydrographic data presented here are not readily available in consolidated records. It aims to support evidence-based planning and policymaking, and to serve as a foundational resource for stakeholders working toward sustainable river basin management.

More than an informational document, Periyar River Atlas is a call to action urging policymakers, researchers, communities, and individuals to join hands in safeguarding this vital river system. As readers engage with the contents of this report, we hope it fosters a deeper appreciation for the Periyar's enduring value and the collective responsibility we all share in ensuring its continued vitality.

In preparing this document, the cPeriyar team devoted considerable effort to researching, tracing, validating, and compiling data from a wide range of primary and secondary sources. We gratefully acknowledge the contributions of various individuals and institutions outside of cPeriyar, whose insights and support have helped enhance the scope and quality of this work. We acknowledge the tireless efforts of the cPeriyar team in preparing this Atlas, as well as the valuable support from institutions, experts, and government agencies who contributed their knowledge, data, and guidance.

Centre for Periyar River Basin Management & Studies (cPeriyar) IIT Palakkad & NIT Calicut

## ACRONYMS AND ABBREVIATIONS

AWS : Automatic Weather Station

cGanga: Centre for Ganga River Basin Management and StudiescPeriyar: Centre for Periyar River Basin Management and Studies

CWC : Central Water CommissionDEM : Digital Elevation ModelFCS : Full Climatic Station

GDSQ : Gauge, Discharge, Silt and Water Quality Site

GDQ : Gauge, Discharge and Water Quality Site

GIS : Geographic Information System

Full Reservoir Level

HEP : Hydro Electric Project

IDRB : Irrigation Design and Research Board

IMD : India Meteorological Department

Km : Kilometer

Km<sup>2</sup> : Square Kilometer

m : Meter

FRL

MCM : Million Cubic Meter

mm : Millimeter

MHIS : Multi-Hazard Information SystemMU : Million Units (1 million KWh)

MW : Megawatt (1 million Watts)

NRCD : National River Conservation Directorate

PRB : Periyar River Basin
PTR : Periyar Tiger Reserve

SHEP : Small Hydro Electric Project

SoI : Survey of India

SRG : Standard Rain Gauge
UID Code : Unique Identity Code

	CONTENTS	
Sl No.	Title	Page No.
1	Introduction	1
2	Periyar Basin: Administrative Divisions (Geographical)	4
3	Rivers of Periyar Basin in Various Districts	6
4	River Basins in India: Level I	7
5	West-Flowing Rivers from Tadri to Kanyakumari Basin: Level II	9
6	West-Flowing Rivers from Tadri to Kanyakumari Basin: Level III	10
7	Dams and Barrages in Periyar Basin	11
8	Major Hydroelectric Projects on River Periyar and Her Tributaries	14
9	Periyar Basin: CWC River Hydrological Measurement Stations	16
10	Periyar Basin: IDRB River Hydrological Measurement Stations	18
11	Periyar Basin: IMD Rain Gauge Stations	20
12	River Network Preparation Methodology	21
13	River Codification Methodology	22
14	Unique Identity Code of Selected Rivers	23
15	Periyar Basin and Its River Network	24
16	Periyar Sub-basin and Its River Network	29
17	Mullayar Sub-basin and Its River Network	30
18	Kattappana Sub-basin and Its River Network	32
19	Cheruthoni Sub-basin and Its River Network	33
20	Chinnar Sub-basin and Its River Network	35
21	Muthirapuzha Sub-basin and Its River Network	37
22	Deviar Sub-basin and Its River Network	39
23	Idamalayar Sub-basin and Its River Network	40
24	Pullut Sub-basin and Its River Network	42

	LIST OF FIGURES	
Sl No.	Caption	Page No.
1	Periyar Basin with its main tributaries	2
2	Periyar River Basin Administrative Divisions (Geographical)	4
3	Level 1 River Basins in India	7
4	Level II Basins in West-flowing rivers from Tadri to Kanyakumari Basin	9
5	Level III Basins in West-flowing rivers from Tadri to Kanyakumari Basin	10
6	Dams and Barrages in Periyar Basin	11
7	Periyar Basin CWC River Hydrological Measurement Stations	16
8	Periyar Basin IDRB River Hydrological Measurement Stations	18
9	Periyar Basin IMD Rain Gauge Stations	20
10	Periyar Basin and its River Network	24
11	Periyar Sub-basin and Its River Network	29
12	Mullayar Sub-basin and Its River Network	30
13	Kattappana Sub-basin and Its River Network	32
14	Cheruthoni Sub-basin and Its River Network	33
15	Chinnar Sub-basin and Its River Network	35
16	Muthirapuzha Sub-basin and Its River Network	37
17	Deviar Sub-basin and Its River Network	39
18	Idamalayar Sub-basin and Its River Network	40
19	Pullut Sub-basin and Its River Network	42

	LIST OF TABLES	
Sl No.	Title	Page No.
1	Periyar Basin Salient Features	3
2	Rivers of Periyar Basin in various districts	6
3	List of Level 1 Basins in India (As Listed by CWC)	8
4	List of Level II Basins in West-flowing rivers from Tadri to Kanyakumari Basin (As Listed by CWC)	9
5	List of Dams and Barrages in Periyar Basin	11
6	Details of Major Dams in Periyar Basin	12
7	Details of Major Barrages in Periyar Basin	13
8	Details of Weirs in Periyar Basin	13
9	Major Hydroelectric Projects in Periyar Basin	14
10	Periyar Basin CWC River Hydrological Measurement Stations	17
11	List of IDRB Rain Gauge Stations	19
12	List of IDRB River gauge Stations	19
13	List of IMD Rain Gauge Stations	20
14	Unique Identity Code of Selected Rivers	23

#### INTRODUCTION

The Periyar River is the longest and one of the most significant rivers in the state of Kerala. Originating from the Chokkampatti malai of Sivagiri Hills, Western Ghats in the Idukki district, the 260.7 km long river traverses a wide range of physiographic zones, flowing from high-elevation forested uplands to densely populated midlands and lowlands, and eventually drains into the Arabian Sea through two major outlets: one at Munambam and the other through Vembanad Lake. The Periyar River Basin of total area 5216 km² extends across two states, covering 5,097 km² in Kerala and 119 km² in Tamil Nadu, supporting ecosystems, agriculture, and millions of people along its course.

The Periyar Tiger Reserve (PTR), located in the Southern Western Ghats, is a critical biodiversity hotspot and a core zone of the Periyar River Basin. It harbors rich tropical forest ecosystems, supporting flagship species like the Bengal tiger, Asian elephant, and numerous endemic flora and fauna. PTR plays a vital role in watershed protection, climate regulation, and groundwater recharge, ensuring perennial flow in the Periyar River. Neelakurinji (Strobilanthes kunthiana), a shrub endemic to the Western Ghats, blooms once every 12 years and carpets the hills in blue. Its flowering is a natural spectacle and serves as an indicator of ecological health and biodiversity in the high-altitude ecosystems of the Periyar region.

The Periyar Basin includes 16 dams, with Idukki and Idamalayar being the most prominent due to their scale, utility, and significance in power generation and irrigation. Idukki Dam, part of a three-dam system (with Cheruthoni and Kulamavu), is one of Asia's highest arch dams. Another important one is Mullaperiyar, built in 1895, it is one of the oldest large masonry dams in India, constructed using lime-surkhi mortar not concrete, it raises structural and safety concerns over time. Despite its age, it continues to function as a key component in interstate water sharing and irrigation for Tamil Nadu. The Periyar Basin hosts several major hydroelectric projects, including Idukki, Lower periyar, Idamalayar, Pallivasal, and Neriamangalam, making it a key contributor to Kerala's renewable energy sector. These projects ensure reliable power supply, aid in grid stability, and supports irrigation. The Periyar Basin is a major hub for spice cultivation, particularly in the highland and midland regions. The basin's fertile soils, water availability, and humid tropical climate make it ideal for growing cardamom, black pepper, nutmeg, clove, and ginger. These high-value crops are crucial for the local economy, supporting thousands of farming households and contributes to Kerala's spice exports.

The Periyar Basin is home to important religious sites that reflect the region's rich cultural and spiritual heritage. Aluva Mahadeva Temple, located on the banks of the Periyar, is a spiritual center known for the annual Sivarathri festival that draws large gatherings and river-centered rituals. Malayattoor Pilgrimage, associated with St. Thomas the Apostle, symbolizes interfaith harmony and deep-rooted Christian traditions in the area. Cochin International Airport (CIAL), located near Aluva, is the first airport in the world fully powered by solar energy. Positioned near the Periyar River, CIAL serves as a

major gateway to central Kerala and contributes to economic growth, tourism, and international connectivity.

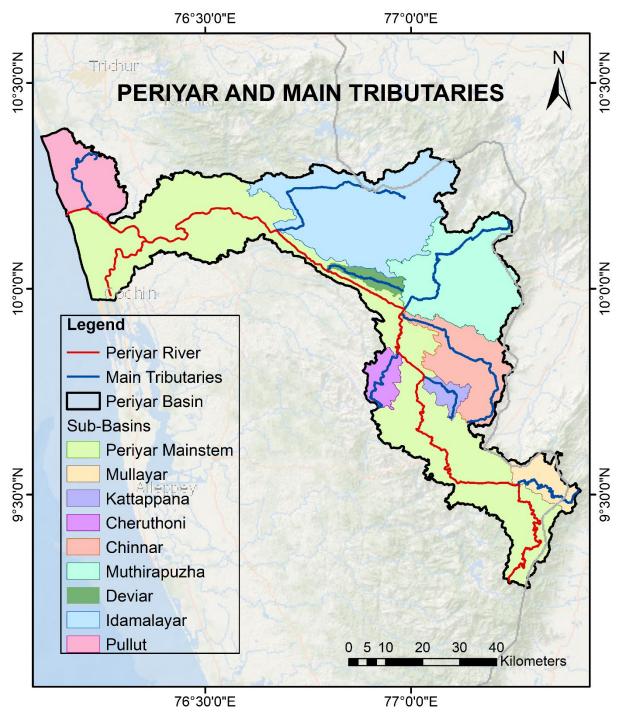


Figure 1: Periyar Basin with its main tributaries

The Periyar basin plays a critical role in sustaining regional biodiversity, agriculture, drinking water supply, industrial activities, and hydropower generation, making it a vital hydrological and socioeconomic resource for the region.

**Table 1: Periyar Basin Salient Features** 

Sl No	Particulars	Details
1	Basin Extent	Latitude: 9°16'20"N and 10°23'23"N and Longitude: 76°06'04"E and 77°24'45"E
2	Total Geographical Area (km²)	5216
2.1	Hill Area (km²)	3908
2.2	Plain Area (km²)	1308
3	Forest Area (km²)	1799
4	Highest Elevation (m)	2681
5	States and their % area contribution in the basin:	Kerala- 5097 Tamil Nadu-119
6	Districts (per Census 2011)	4 (3- Kerala, 1- Tamilnadu)
7	Sub-districts (per Census 2011)	13
8	Towns (per Census 2011)	54 (Class I: 0; Class II: 02; Class III: 26; Class IV: 17; Class V: 8; Class VI: 1)
9	Villages (per Census 2011)	152
10	Total Population (per Census 2011)	3.76 Million
11	Average Annual Rainfall (mm)	Ranges from 1800 mm to 4200 mm
12	Average Temperature Range ( <sup>0</sup> C)	Minimum of 14°C to Maximum of 32°C
13	Major Rivers	Periyar, Mullayar, Chinnar, Muthirapuzha, Idamalayar, Kattappanayar, Cheruthoniyar, Deviyar, Pullut river
14	Number of Major Sub-basins	7
15	Number of Water Resources Structures	16 Dams, 1 Barrage, 5 Weirs
16	Highest Dam	Idukki Arch Dam
17	Longest Dam	Idukki Arch Dam
18	Highest Barrage	Bhoothathankettu Barrage
19	Longest Barrage	Bhoothathankettu Barrage
20	Number of HE Projects (> 25 MW)	8
21	Number of CWC Sites	2
22	Number of Ground Water Observation wells	120
23	Water Tourism and Water Sports Sites	Thekkady (Periyar Lake), Idukki Reservoir, Idamalayar Reservoir, Bhoothathankettu Dam, Thattekad, Anakulam, Aluva Manappuram, Kalady, Malayattoor, Kodanad, Perumbavoor Riverfront, Paniyeli Poru, Kuttampuzha, Neriamangalam, Vellathooval, Munnar

## PERIYAR BASIN: ADMINISTRATIVE DIVISIONS (GEOGRAPHICAL)

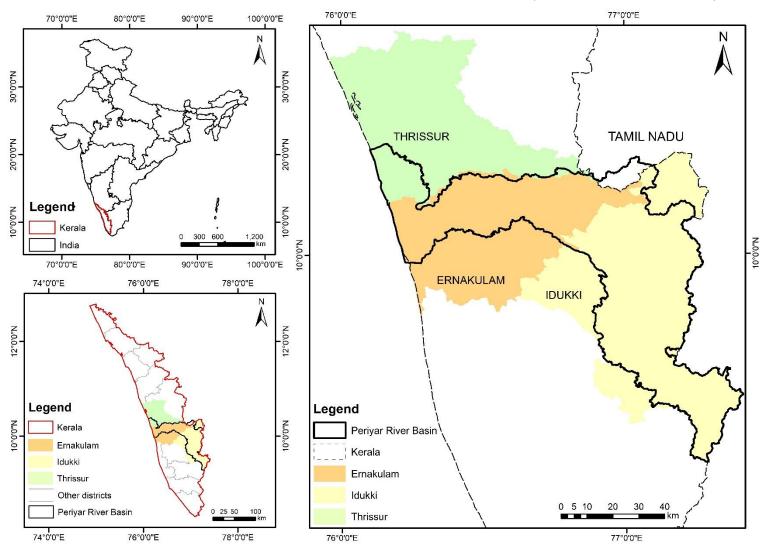


Figure 2a: Periyar River Basin Administrative Divisions (Geographical)

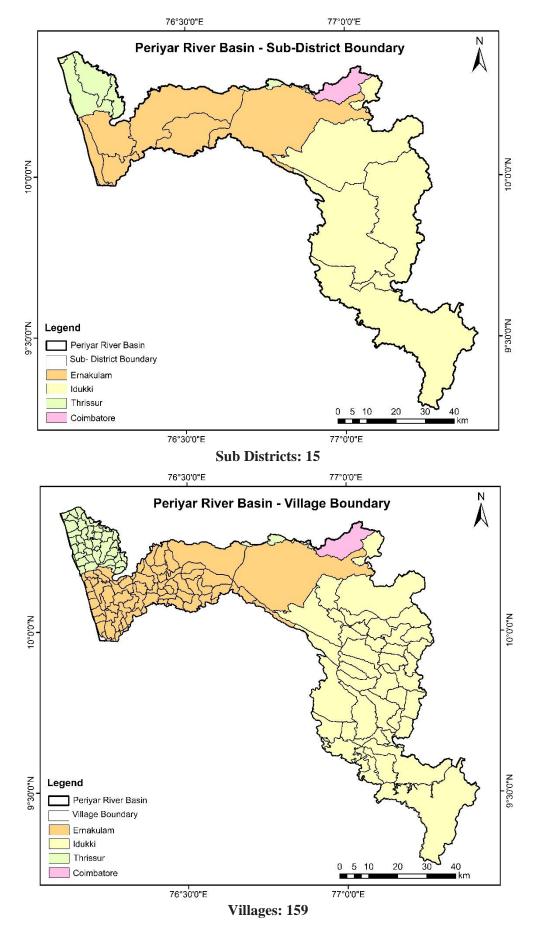


Figure 2b: Periyar River Basin Administrative Divisions (Geographical)

## RIVERS OF PERIYAR BASIN IN VARIOUS DISTRICTS

**Table 2: Rivers of Periyar Basin in various districts** 

Sl No.	District	Named Rivers	Unnamed Rivers	River Name
1	Thrissur	8	151	Anaimalai Ar, Karupadanna Puzha, Kulinirkai Todu, Nallamalai Ar, Periyar River, Pullut River, Tachchapalli Todu, Vallikilli Todu/Muttika Todu/ Penturuthu Todu
2	Ernakulam	64	1153	Anaimalai Ar, Amman Todu, Anachal Todu, Anaikayam Todu, Anakkulam Ar, Aniyil Thodu, Chattangad Todu, Chela Todu, Chengal Todu, Chengal Todu (a), Chengal Todu (b), Cherpuram Todu, Cherpuram Todu/Pachankuttu Todu, Chulli Todu/Kotayi Todu, Idamala Ar, Itili Ar, Iyyampilli Todu, Kakani Todu, Kalarkuzhi Todu, Kaliman Todu, Karintiri Ar, Kazhutakkaduchira Todu, Kulampattu Todu, Kulinirkai Todu, Kunji Ar, Kuthungal Todu, Kuttampuzha, Manali Ar, Manali Ar (a), Manda Todu, Manikandanchal, Manjali Todu/Kotakulanagara Todu/Uzhattu Puzha/Mangalamtazhalam Todu/ParappuTodu, Mannathil Todu, Munnam Todu, Nadalkal Ar, Nadalkal Ar (a), Nallamalai Ar, Nayarambalam Todu, Nedungad Puzha, Ongithodu River, Ongithodu River (a), Parakkattazhakam Todu, Parisa Kuttu Ar, Pazhangad Todu, Periyar River, Periyar River (a), Perum Todu, Pichchi Ar/Kudal Ar, Pullani Todu, Pullut River, Puttan Todu, Puyankutti Ar, Ramavarma Canal, Rapra Todu, Tattapalli River, Thundalli Thodu, Tuduppi Ar/Mamala Todu/, Vadattupara Todu, VallamTodu, Vamuzhi Todu, Vara Puzha, Vara Puzha(a), Vattakulathu Todu, Vazhakuttu Todu
3	Idukki	63	10800	Anakkulam Ar, Anamudi Ar, Anayirangal River, Aruvi Oda, Chemman Ar, Cheruthoni Todu, Chettichchi Kayal, Chinna Kallar Nadi/Kumarikkai Ar, Chinnar River, Chintal Ar, Chittur Ar, Churakkotta Todu, Churuli Todu, Devi Ar, Emakkadavu Ar, Gudrale Ar, Idamala Ar, Inchippara Todu, Irattayar, Irukutti Oda, Kadal Ar, Kadavakadu Todu, Kallar Ar, Kallar River, Kallarkutti Ar, Kannambadi Todu, Kannimala Ar, Karangal Todu, Karikkara Todu, Karindiri Ar, Karintiri Ar, Kattappana Ar, Kavala Todu, Kolikanam Oda, Kottamala Pallam, Kulamavu Lake, Kunji Ar, Machchan Oda, Maddalakutti Todu, Mankulam Ar/Kallar River/Metassari Ar, Meatakadu Ar, Mulla Ar, Muthirapuzha River, Nadalkal Ar, Nirar, Palar Ar, Palkulam Todu, Pampalampara Ar, Panni Ar, Pazhayeri Todu, Pekkanam Todu, Periyakadavu Todu, Periyar River, Povar Nadi, Puttanal Todu, Puvarasu Oda, Tengakkal Todu, Tenkasi Oda, Tuduppi Ar/Mamala Todu/, Tuval Ar (Karitodu), Ummikkuppan Todu, Uppu Ar, Vazhukkappara Todu, Vemban Tanni
4	Coimbatore	10	266	Chinna Kallar Nadi/Kumarikkai Ar, Idamala Ar, Itili Ar, Kallar, Karinandu Todu, Manali Ar, Nallamalai Ar, Nirar, Povar Nadi, Puvar Nadi

### RIVER BASINS IN INDIA: LEVEL I

A Level I basin is the land area drained by a main river and all its tributaries, defined by natural boundaries, typically ridges or elevated areas that direct water flow. In India, the major river basins categorized as Level I basins are listed by the Central Water Commission (CWC), as shown in the map below.

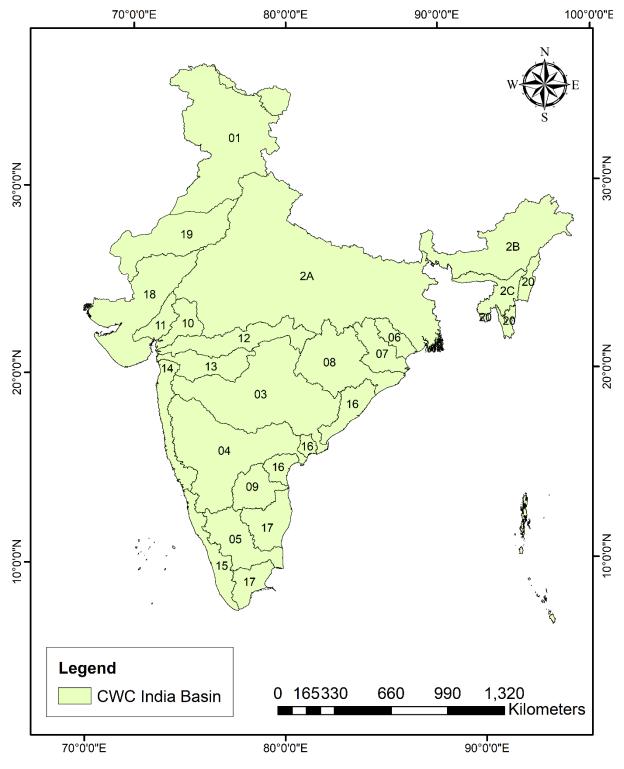


Figure 3: Level I River Basins in India

Source: CWC

Table 3: List of Level I Basins in India (As Listed by CWC)

Basin Code	Basin Name
1	Indus (Up to Indian Border)
2a	Ganga
2b	Brahmaputra
2c	Barak and others
3	Godavari
4	Krishna
5	Cauvery
6	Subernarekha
7	Brahmani and Baitarni
8	Mahanadi
9	Pennar
10	Mahi
11	Sabarmati
12	Narmada
13	Тарі
14	West-flowing rivers from Tapi to Tadri
15	West-flowing rivers from Tadri to Kanyakumari
16	East flowing rivers between Mahanadi and Pennar
17	East-flowing rivers between Pennar and Kanyakumari
18	West flowing rivers of Kutch and Saurashtra including Luni
19	Area of inland drainage in Rajasthan
20	Minor rivers draining into Myanmar (Burma and Bangladesh)

Source: CWC

## WEST-FLOWING RIVERS FROM TADRI TO KANYAKUMARI BASIN: LEVEL II

A Level II basin is a subdivision within a Level I basin, focused on a major tributary of the main river. These basins serve as distinct hydrological units within the larger river basin, enabling more localized analysis and management. Each Level II basin gathers water from its own network of smaller streams and channels, which ultimately contributes to the flow of the main river. A list of some of the major Level III basins within the West-flowing rivers from Tadri to Kanyakumari Basin is illustrated in the map below.

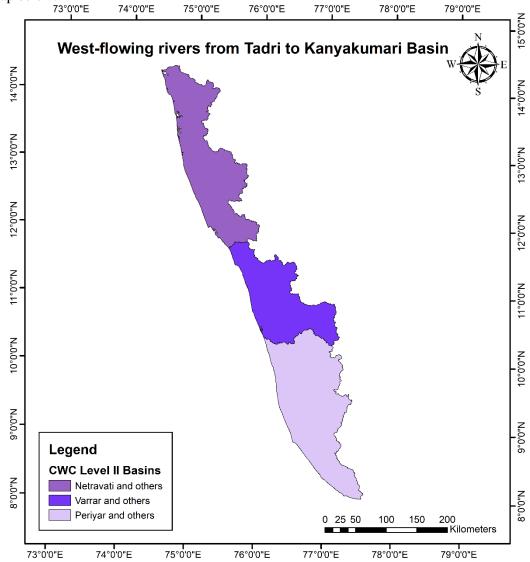


Figure 4: Level II Basins in West-flowing rivers from Tadri to Kanyakumari Basin

Table 4: List of Level II Basins in West-flowing rivers from Tadri to Kanyakumari Basin (As Listed by CWC)

<b>Basin Code</b>	Basin Name
NET	Netravati and Others
VAR	Varrar and Others
PAR	Periyar and Others

## WEST-FLOWING RIVERS FROM TADRI TO KANYAKUMARI BASIN: LEVEL III

A Level III basin further subdivides a Level II basin into smaller areas centered around key streams or sections of a tributary. These divisions are often made to facilitate focused studies, such as assessing localized pollution sources, groundwater recharge zones, or specific habitats within the watershed. A map illustrating some of the significant level III basins within the West-Flowing rivers from Tadri to Kanyakumari basin is shown below.

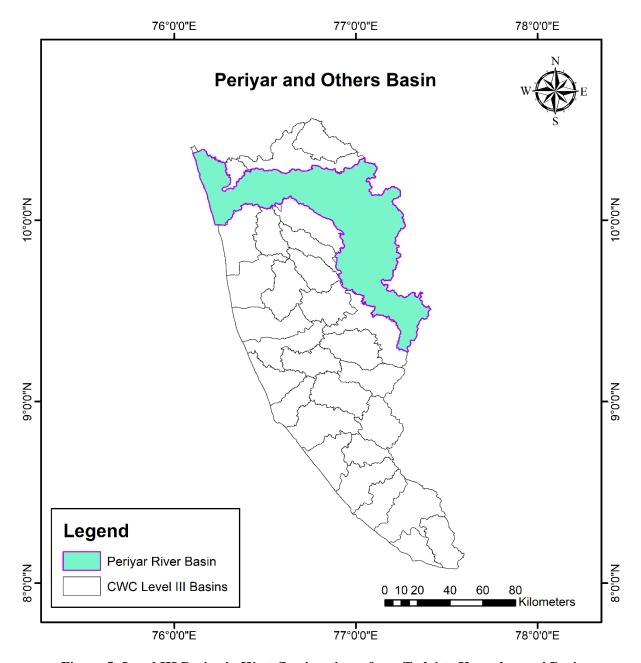


Figure 5: Level III Basins in West-flowing rivers from Tadri to Kanyakumari Basin

## DAMS AND BARRAGES IN PERIYAR BASIN

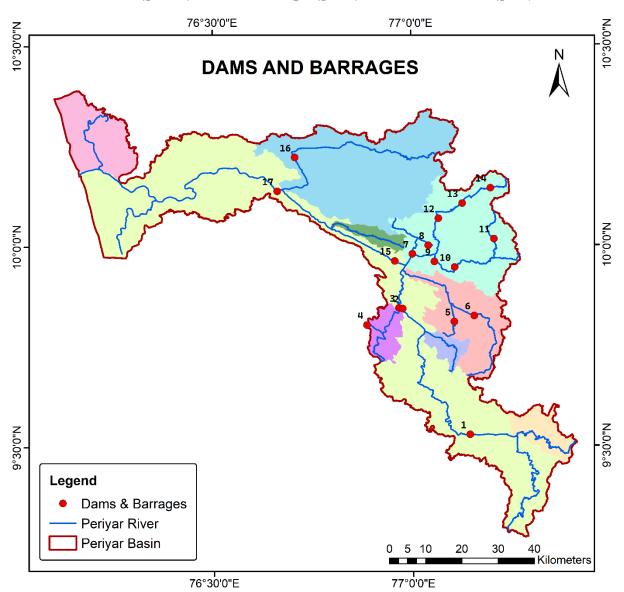


Figure 6: Dams and Barrages in Periyar Basin

**Table 5: List of Dams and Barrages in Periyar Basin** 

Sl No	Dams and Barrages	Sl No	Dams and Barrages
1	Mullaperiyar Dam	10	Mukkudil Dam
2	Idukki Dam	11	Anayirankal Dam
3	Cheruthoni Dam	12	Ramaswamy Aiyar Headworks Dam
4	Kulamavu Dam	13	Mattupetty Dam
5	Erattayar Dam	14	Kundala Dam
6	Kallar Dam	15	Lower Periyar Dam
7	Kallarkutty Dam	16	Idamalayar Dam
8	Sengulam Dam	17	Bhoothathankettu Barrage
9	Ponmudi Dam		

## MAJOR DAMS ON RIVER PERIYAR AND HER TRIBUTARIES

**Table 6: Details of Major Dams in Periyar Basin** 

	Details of Major Dams in Periyar Basin											
Sl No	Name	Туре	Year of Completion	Height of dam m	Length of dam   Total Storage Capacity   Fo		Full Reservoir Level (FRL)	Whether gated or not				
1	MullaPeriyar	Surkhi Concrete	1895	53.64	365.7	443	41.45	No				
2	Idukki	Concrete Double- curvature Arch dam	1976	168.91	365.85	1998.57	732.62	No				
3	Cheruthoni	Straight gravity concrete	1976	138	650.9	1998.57	732.62	Yes				
4	Kulamavu	concrete and masonry	1976	100	385	1998.57	732.62	No				
5	Erattayar Dam	Concrete Gravity	1975	19.81	146.3	5.352	754.38	yes				
6	Kallar Dam	Concrete Gravity	1975	12.19	57.91	0.793	824.48	yes				
7	Kallarkutty	Masonry Gravity	1961	45	182.22	6.8	456.59	Yes				
8	Sengulam Dam	Masonry Gravity	1957	26.84	143.26	0.71	847.65	No				
9	Ponmudi Dam	Masonry Gravity	1965	57.71	288.80	51.54	707.75	Yes				
10	Mukkudil/Kuthumkal Dam		2000									
11	Anayirankal Dam	Earthen dam	1965	34.14	326.13	50.68	1207.02	No				
12	RA Headworks Dam	Masonry	1944	10.9	39.62	0.223	1450.92	Yes				
13	Mattupetty	Concrete Gravity	1956	46.33	237.7	55.23	1599.59	Yes				
14	Kundala Dam	Masonry Gravity	1947	36.94	259.38	7.65	1758.69	Yes				
15	Lower Periyar Dam	Concrete Gravity	1998	32.36	284	5.3	253	Yes				
16	Idamalayar	Concrete Gravity	1987	91	373	1089	169	Yes				
17	Bhoothathankettu Barrage		1967									

Table 7: Details of Major Barrages in Periyar Basin

Sl No	Name	Туре	Year of Completion	Max Floor Level	Length of dam m	River	District	Sub-District	Village	No of Shutters
1	Bhoothathankettu Barrage	Irrigation Barrage	1967	34.95	210.92	Periyar	Ernakulam	Kothamangalam	Pindimana	15 nos of Shutters

**Table 8: Details of Weirs in Periyar Basin** 

Sl No	Name	Longitude (°E)	Latitude (°N)	District Village		Full Reservoir Level (FRL) m	Storage at FRL (MCM)	Height m	Length m	Spillway
1	Narakakkanam	77	9.833333	Idukki	Thankamani	768.00	0.00396	11.50	45.2	Ungated – Overflow section
2	Viripara	76.9615	10.07766	Idukki	Mankulam	1141.59	Diversion only	4.57		Overflow weir
3	Vellathooval	77.02779	9.974422	Idukki	Vellathooval	472.0	0.069	16	75	Ungated
4	Parakkadavu	77.03278	10.01083	Idukki	Vellathooval	722.3	Diversion only			
5	Mullakkanam	77.03278	10.01083	Idukki	Vellathooval	717.50	Diversion only			

## MAJOR HYDROELECTRIC PROJECTS ON RIVER PERIYAR AND HER TRIBUTARIES

Table 9: Major Hydroelectric Projects in Periyar Basin

				Salient Features Reserv					voir Infor	Technical Aspects		
Sl No	Name of the Project	Location	District	Capacity (MW)	River	Dam/ Weir	Annual Energy Potential (MU)	Date of Commissioning	Catchment Area (km²)	Gross Storage (MCM)	Full Reservoir level (m)	Turbine
1	Neriamangalam Power Station						158	1961				3, Francis Vertical
	Neriamangalam Extension Scheme	Panamkutty	Idukki	77.5	Muthirapuzha	Kallarkutty	58.27	2008	281.24	5.49	456.59	1, Francis Vertical
2	Lower Periyar HEP	Karimanal	Idukki	180	Muthirapuzha	Lower periyar (Pambla Dam)	493	1997	584	4.55	169	3, Francis Vertical
3	Idamalayar HEP	Idamalayar	Ernakulum	75	Idamalayar	Idamalayar	380	1987	481.79	1153	253	2, Francis Vertical
4						Kundala			37	7.65	1,758.7	
	Pallivasal HEP	Munnar	Idukki	37.5.	Muthirapuzha	Madupetty	284	1940	104	55	1599.59	6, Pelton Horizontal
						RA Head Works			232	NA	1450.92	110112011
5	Idukki Hydro Electric Project	Idukki	Idukki	780	Periyar	Idukki Arch Dam, Cheruthoni Kulamavu	2148	1976	640	1996.3	732.62	6, Pelton Vertical
6	Sengulam Power Station	Vellathooval	Idukki	50.8	Muthirapuzha	Sengulam	180	1954	5.18	2.31	847.35	4, Pelton Horizontal

			Reservoir Information									
Sl No	Name of the Project	Location	District	Capacity (MW)	River	Dam/ Weir	Annual Energy Potential (MU)	Date of Commissioning	Catchment Area (km²)	Gross Storage (MCM)	Full Reservoir level (m)	Turbine
7	Panniyar Power	Vellathooval	Idukki	32.4	Panniar	Anayirankal	158	1963	64.92	48.97	707 .745	2, Francis
	Station					Ponmudi			221.75	47.4		Vertical
8	Mattupetty HEP	Madupetty	Idukki	2	Muthirapuzha	Madupetty	6.35	1998	105	55.23	1599.59	2, Francis Horizontal
9	Vellathooval SHEP	Vellathooval	Idukki	3.6	Muthirapuzha		12.17	2016		NA		2, Kaplan Horizontal
10	Upper Kallar Power station	Kainagiri	Idukki	2	Kallar	Viripara weir	5.14	2021	28.5	N	A	2, Kaplan Horizontal

	Projects Under Construction						
Sl No	Name of the Project	Location	District	Capacity (MW)	River	Dam/ Weir	Annual Energy Potential (MU)
11	Pallivasal Extension Scheme	Munnar	Idukki	60	Muthirapuzha	RA Head Works	153.9
12	Thottiyar HEP	Neendapara	Idukki	40	Deviar	Valara Checkdam	99
13	Chinnar SHEP	Konnathady	Idukki	24	Chinnar/ Perinjankutty	Chinnar Checkdam	76.45
14	Bhoothathankettu SHEP	Kothamangalam	Ernakulam	24	Periyar	Bhoothathankettu Barrage	83.5

## PERIYAR BASIN: CWC RIVER HYDROLOGICAL MEASUREMENT STATIONS

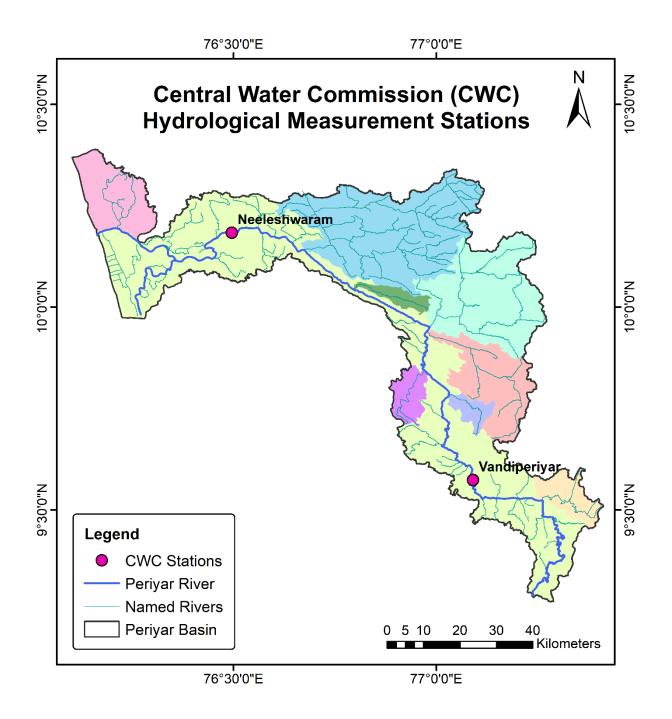


Figure 7: Periyar Basin CWC River Hydrological Measurement Stations

## PERIYAR BASIN: CWC RIVER HYDROLOGICAL MEASUREMENT STATIONS

**Table 10: Periyar Basin CWC River Hydrological Measurement Stations** 

	CWC Hydrological Measurement Stations						
Sl No	Site	State	District	River/tributary	Site type	Starting date of Monitoring	Catchment area covered in Sq.km
1	Neeleshweram	Kerala	Ernakulam	Periyar	GDSQ	19/01/1971 16/03/1971 26/09/1972 15/06/1978	4234
2	Vandiperiyar	Kerala	Idukki	Periyar	GDQ	19/04/1999 07/06/2000 01/10/2002	712

## PERIYAR BASIN: IDRB RIVER HYDROLOGICAL MEASUREMENT STATIONS

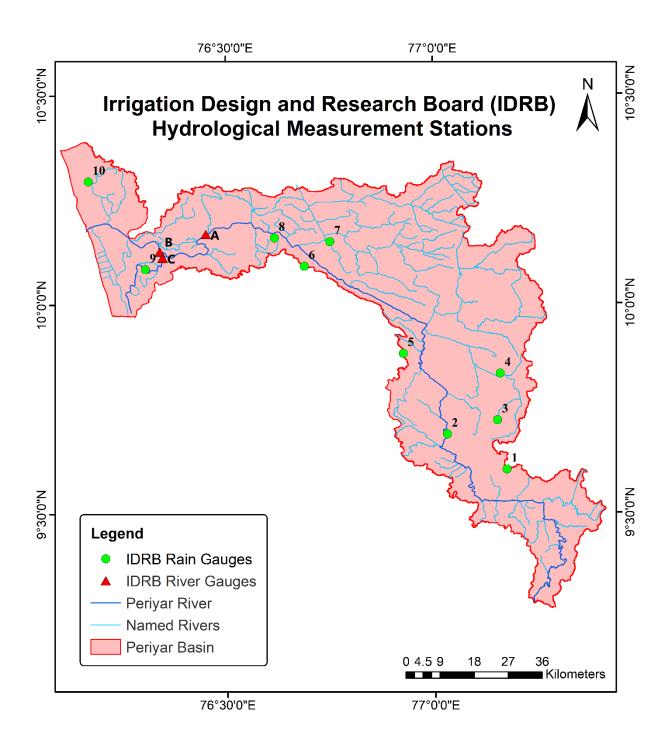


Figure 8: Periyar Basin IDRB River Hydrological Measurement Stations

**Table 11: List of IDRB Rain Gauge Stations** 

Sl No	Name of Site	District	Type
1	Kumili	Idukki	SRG
2	Chinnar estate	Idukki	SRG
	(semini valley)		
3	Vandanmedu	Idukki	SRG
4	Nedumkandam	Idukki	SRG
5	Painavu	Idukki	FCS&AWS under MHIS I
6	Neriyamangalam	Ernakulam	SRG
7	Keerampara	Ernakulam	SRG
8	Boothathankettu	Ernakulam	SRG&AWS under MHIS I
9	Aluva	Ernakulam	SRG
10	Mathilakam	Thrissur	SRG

**Table 12: List of IDRB River Gauge Stations** 

ID	Name of Site	District
A	Kalady	Ernakulam
В	Mangalapuzha	Ernakulam
С	Marthandavarma	Ernakulam



### PERIYAR BASIN: IMD RAIN GAUGE STATIONS

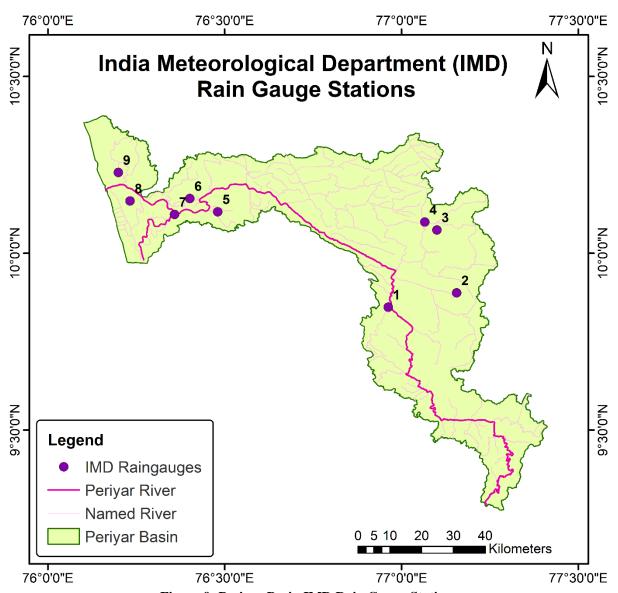


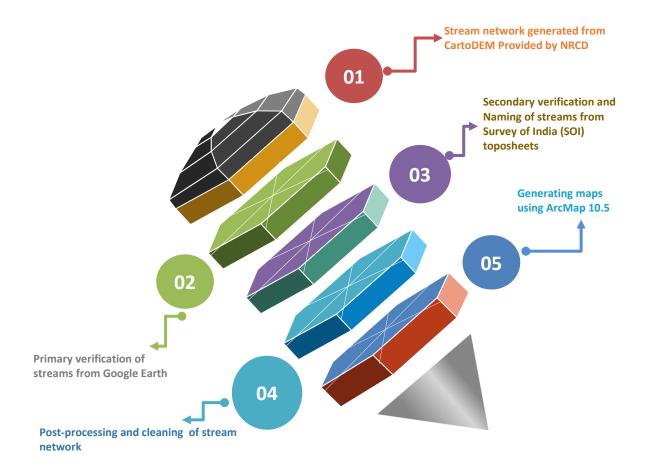
Figure 9: Periyar Basin IMD Rain Gauge Stations

**Table 13: List of IMD Rain Gauge Stations** 

Sl No	Gauge Site	District		
1	KWA Water Testing Lab (near Cheruthoni Dam)	Idukki		
2	Myladumpara	Idukki		
3	Devikulam	Idukki		
4	Munnar	Idukki		
5	Taluk Office, Kunnathunad, Perumbavur	Ernakulam		
6	Cochin International Airport	Ernakulam		
7	Permanent Way, Southern Railway, Aluva			
8	Taluk Office, Paravur			
9	Kodungallur	Thrissur		

#### RIVER NETWORK PREPARATION METHODOLOGY

The method adopted, in brief, to obtain the river network are stepwise as follows:



❖ All streams originating from populated areas (urban or rural) are covered, even if they are less than 1 km (if it is visible) on Google Earth images.

**Disclaimer:** The accuracies of the maps generated by the above method are subject to the limitations of the data processing tools and software used for the particular geographical regions as represented in Google Earth images, and are subject to future refinement.

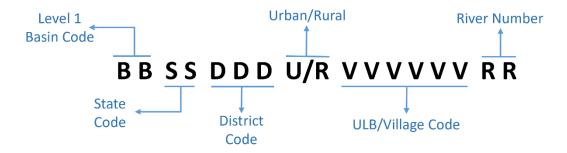
Stream networks digitized from Survey of India (SoI) toposheets exhibited spatial misalignments when compared with Google Earth satellite imagery, particularly in highland regions. In such cases, the NRSC stream network was adopted as the base layer due to its better positional accuracy. Further cross-verification and manual tracing of minor-order streams were carried out using Google Earth imagery. However, delineation in dense forested highland areas remained challenging and is subject to interpretation limitations due to canopy cover and resolution constraints.

#### RIVER CODIFICATION METHODOLOGY

In the present Atlas, alphanumeric characters are used for coding the river systems. A combination of natural and administrative boundaries is used to assign a code to each river and stream. Each sub-step in the codification system is assigned a digit or alphabet that indicates the length of the code up to that point, and the total length of the code is 16 digits. For the rivers originating outside the national boundary of India, the point where the river enters the national boundary is considered as its origin point.

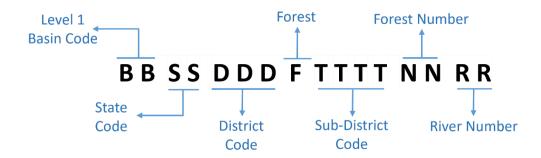
## a. River originates in Urban/Rural Area:

The first two digits denote the code for the major basin, based on the system proposed by the Central Water Commission (CWC), Government of India. Following this, the two alphabets indicate the state where the river originates, such as "KL" for Periyar. The following three digits represent the district where the river originates. The next character, 'U' or 'R,' indicates whether the origin is in an urban or rural area. The subsequent six digits are the Urban Local Body (ULB) code if the river originates in an urban area or the village code if it originates in a rural area. The district and ULB/village code correspond to the origin of the river, and are available from Local Government Directory, GoI (LGD) website. The final digit indicates the number of the specific river that originates within the specific location falling within an administrative boundary such as town/city or a village.



#### b. River originates in Forest Area:

The first two digits denote the code for the major basin, based on the system proposed by the Central Water Commission (CWC), Government of India. Following this, the two alphabets indicate the state where the river originates, such as "KL" for Periyar. The following three digits indicate the district where the river originates. The next character, 'F', signifies that the river originates in a forest area. The subsequent four digits denote the subdistrict code where the forest is located. The following two digits indicate the number of the specified forest in the sub-district. The district, sub-district, and forest codes correspond to the river's origin, with district and subdistrict codes available from the Local Government Directory (LGD) website, GoI. The final digit indicates the number of the river that originates within the specific forest cover or range.



**Table 14: Unique Identity Code of Selected Rivers** 

SI	River Name	Length	UID Code	Sl	River Name	Length	UID Code
No		(km)		No		(km)	
1	Periyar River	260.763	15KL556R62811114	26	Aruvi Oda	16.121	15KL556R62811105
2	Idamala Ar	66.789	15KL556R62805416	27	Parakkattazhaka	15.42	15KL555R62794601
2	Idamaia Ai	00.789	13KL330K02803410	21	m Todu	13.42	13KL333K02794001
3	Muthirapuzha	57.037	15KL556R62805415	28	Anamudi Ar	15.246	15KL556R62805411
	River						
4	Kallar River	38.770	15KL556R62808201	29	Chinna Kallar	15.068	15KL556R62805412
					Nadi		
5	Panni Ar	36.919	15KL556R62806501	30	Kuttampuzha	14.431	15KL555R62804111
6	Mulla Ar	33.305	15KL556R62811108	31	Irattayar	14.153	15KL556R62807901
7	Manjali Todu	28.431	15KL555R62796602	32	Nirar	14.061	15KL556R62805414
8	Devi Ar	28.296	15KL556R62805603	33	Kuthungal Todu	13.57	15KL555R62803801
9	Pullut River	27.362	15KL566U62793101	34	Kallar	13.329	15TN569U25268902
10	Cheruthoni	26.789	15KL556R62810304	35	Manali Ar	13.243	15KL556R62805405
	Todu						
11	Chulli Todu	26.267	15KL555R62796709	36	Chittur Ar	13.238	15KL556R62805702
12	Karintiri Ar	25.821	15KL556R62805410	37	Chengal Todu	13.179	15KL555U62797402
13	Mankulam Ar	25.085	15KL556R62805408	38	Nadalkal Ar	12.956	15KL555R62804113
14	Kattappana	20.565	15KL556R62808101	39	Vara Puzha	12.762	15KL555U62798001
	Ar						
15	Chinnar River	19.772	15KL556R62807101	40	Kannimala Ar	12.588	15KL556R62805401
16	Thundalli	18.383	15KL555R62796711	41	Puyankutti Ar	12.323	15KL555R62804112
	Thodu						
17	Kallar Ar	18.214	15KL556R62805701	42	Vazhukkappara	12.275	15KL556R62811111
10	A . 1	17.924	15VL 55CD C2005402	42	Todu	10.11	15W 55 CD C2011102
18	Anayirangal River	17.824	15KL556R62805402	43	Churakkotta Todu	12.11	15KL556R62811103
19	Pichchi Ar	17.35	15KL555R62804115	44	Pazhayeri Todu	12.036	15KL556R62808702
20	Chintal Ar	17.251	15KL556R62810301	45	Rapra Todu	11.962	15KL555R62796702
21	Gudrale Ar	17.204	15KL556R62805403	46	Cherpuram Todu	11.803	15KL555R62804104
22	Chemman Ar	17.204	15KL556R62806901	47	Maddalakutti	11.367	15KL556R62811110
22	Cheminan Al	17.079	13KL330K02000701	4,	Todu	11.507	13KL330K02011110
23	Anachal Todu	16.955	15KL555U62798701	48	Tuduppi Ar	11.013	15KL556R62805602
24	Karindiri Ar	16.635	15KL556R62810303	49	Tuval Ar	10.646	15KL556R62807501
25	Vallikilli	16.420	15KL566R62789701	50	Povar Nadi	10.116	15KL556R62805413
	Todu						

The table lists the UID code for selected rivers in Periyar.

## PERIYAR BASIN AND ITS RIVER NETWORK

Periyar River UID Code	15KL556R62811114
River Length (km)	260.7
Basin Area (km²)	5216
Number of Named Rivers	126
Number of Unnamed Rivers	12681
Length of Named Rivers (km)	1715.5
Length of Unnamed Rivers (km)	9848

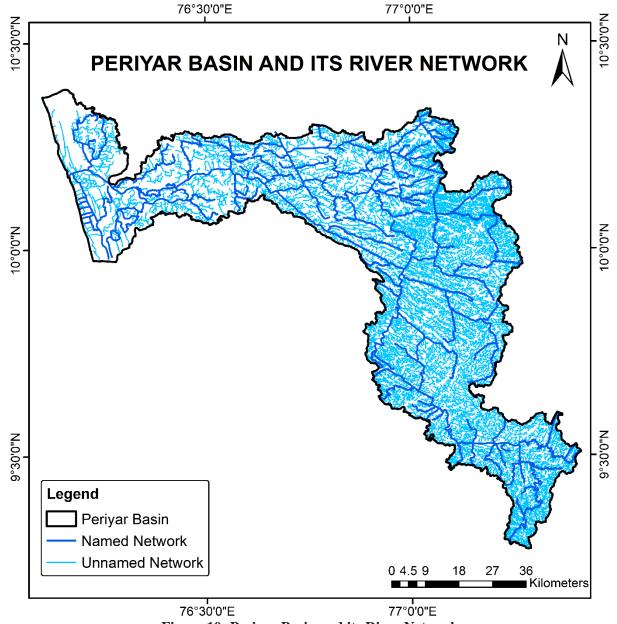
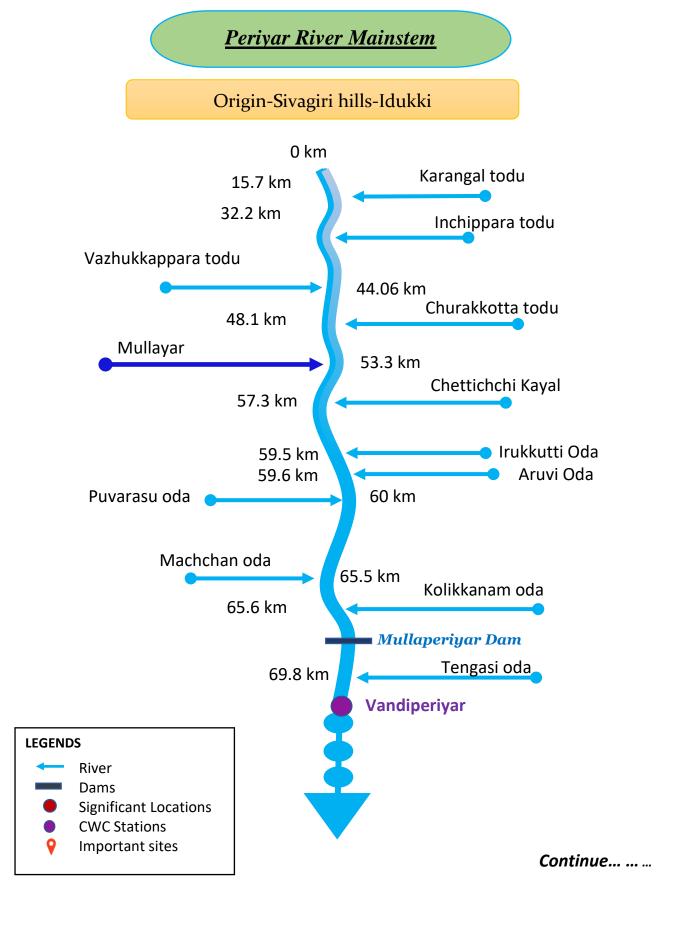


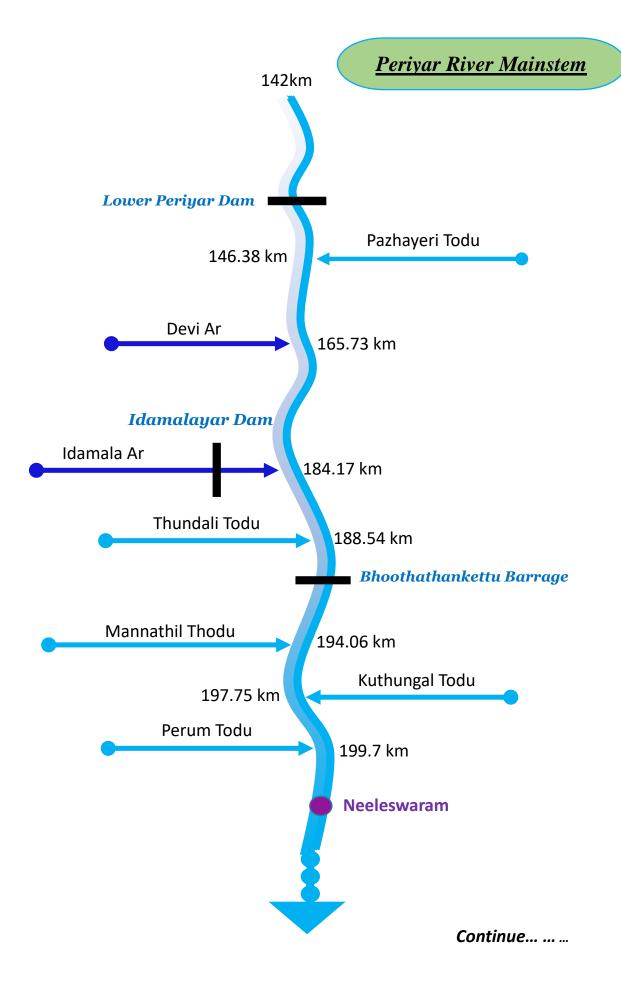
Figure 10: Periyar Basin and its River Network

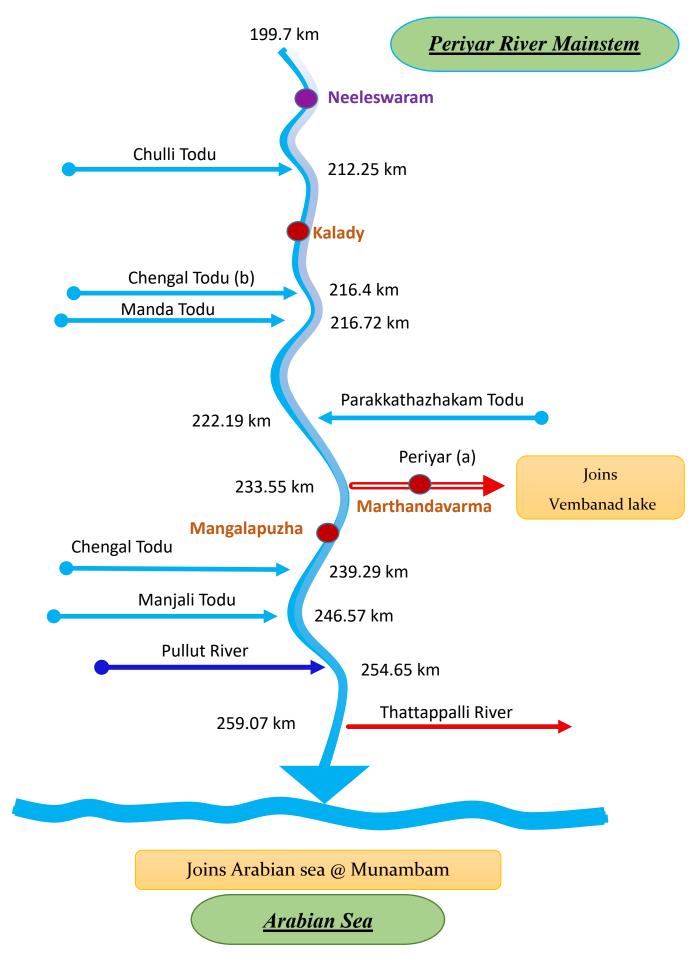
### PERIYAR RIVER MAIN STEM FLOW DIAGRAM



## Periyar River Mainstem







## PERIYAR SUB-BASIN AND ITS RIVER NETWORK

Periyar River UID Code	15KL556R62811114			
River Length (km)	260.7			
Basin Area (km²)	2300.8			
Number of Named Rivers	59			
Number of Unnamed Rivers	4505			
Length of Named Rivers (km)	797			
Length of Unnamed Rivers (km)	3886.3			

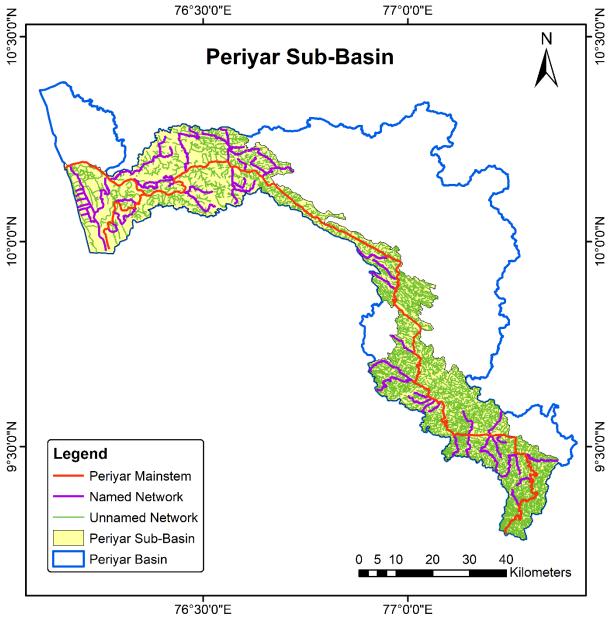
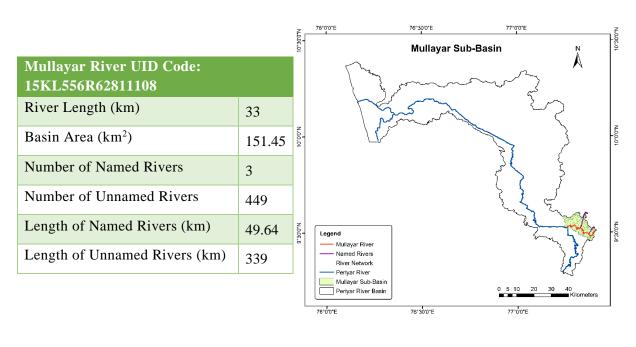


Figure 11: Periyar Sub-basin and its River Network

#### MULLAYAR SUB-BASIN AND ITS RIVER NETWORK



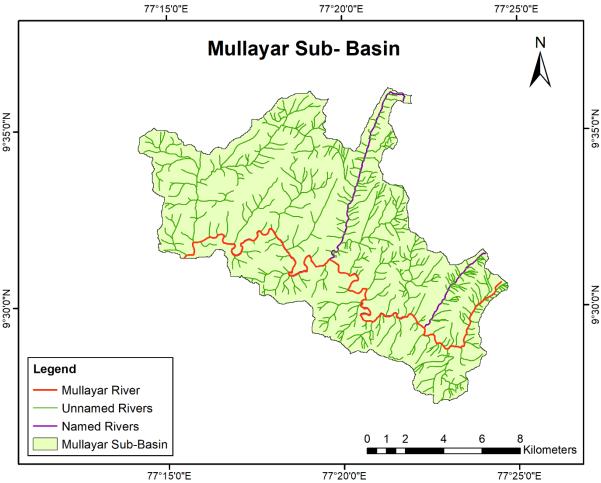
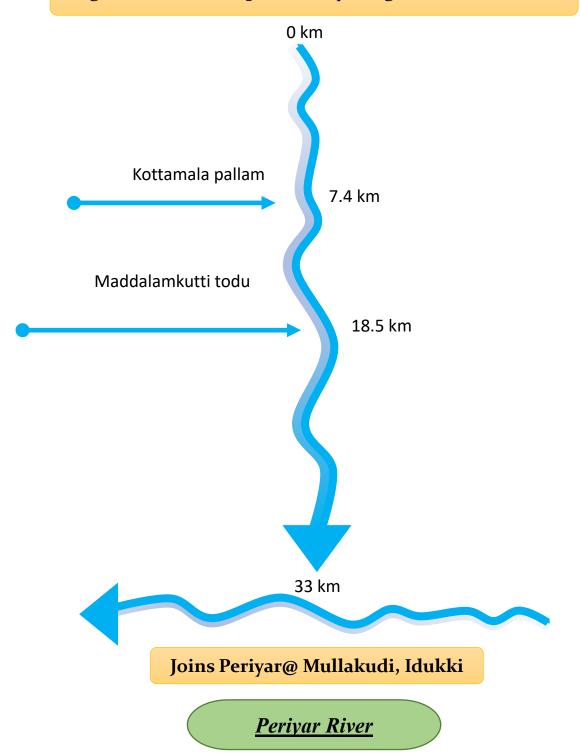


Figure 12: Mullayar Sub-basin and its River Network

## MULLAYAR RIVER MAIN STEM FLOW DIAGRAM

## Mullayar River

# Origin @ Kottamalai peak (Periyar Tiger Reserve)-Idukki



## KATTAPPANA SUB-BASIN AND ITS RIVER NETWORK

			76"0"0"E	76°30'0"E	77°00°E	77"30"0"E
Kattappanayar River UID Code 15KL556R62808101	:		( vew day	Kattapp	ana Sub-Basin	× ×
River Length (km)	20.43		75		£ 2	
Basin Area (km²)	69.83	10°0°0'N				19°0°N
Number of Named Rivers	1					
Number of Unnamed Rivers	139				E Service Constitution of the service of the servic	
Length of Named Rivers (km)	20.43	9°300°N	Legend		East of the state	N. III.
Length of Unnamed Rivers (km)	127.83		Kattappanayar River Network Periyar River Kattappana Sub-Basin			}
			Periyar River Basin	<u> </u>	0 5 10 20 30	40 Kilometers
			76"0"0"E	76°30'0"E	77"00"E	77"30"0"E

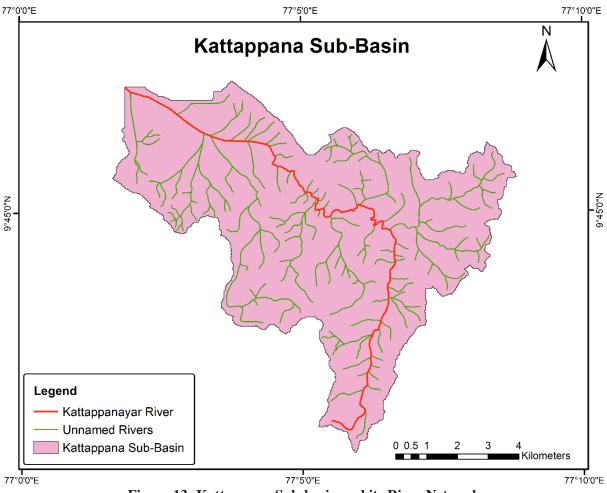


Figure 13: Kattappana Sub-basin and its River Network

## CHERUTHONI SUB-BASIN AND ITS RIVER NETWORK

		76101	0°E	76°30'0"E	77°0′0″E	77*30'0*E	
		]		Cheruthoni	Sub-Basin	Ň	
Cheruthoniyar River UID Code: 15KL556R62810304			The way were	~~~~			
River Length (km)	26.77	N.O		and the same		Innovation	N.0
Basin Area (km²)	116.89	10°0'0"N			E.	{	2
Number of Named Rivers	2					}	
Number of Unnamed Rivers	589		Legend	1	Servery Ch.	\_\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-
Length of Named Rivers (km)	35.15	9*30'0'N	Cheruthoni River Named Rivers River Network		S. W.	~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	9 300
Length of Unnamed Rivers (km)	340.93		Periyar River Cheruthoni Sub-Basin Periyar River Basin		0 5 10	20 30 40 Kilometers	
		76°0'	'0"E	76°30'0"E	77°0'0°E	77°30'0"E	

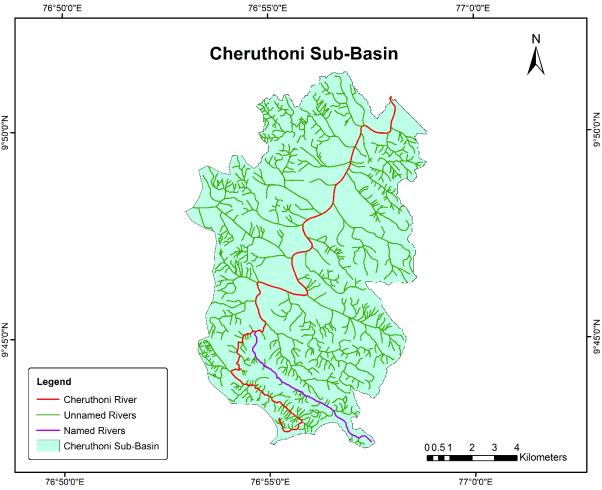
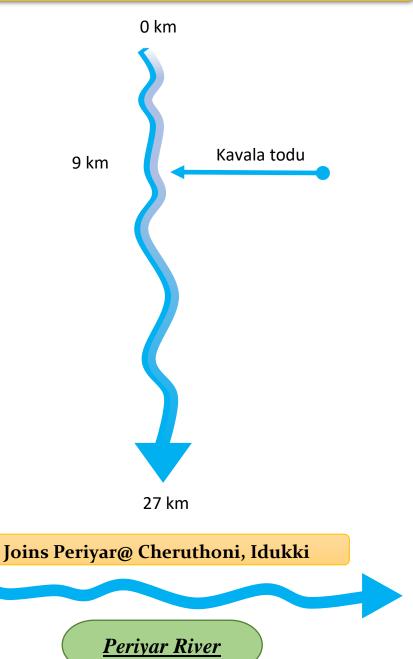


Figure 14: Cheruthoni Sub-basin and its River Network

## CHERUTHONI RIVER MAIN STEM FLOW DIAGRAM

# Cheruthoni River

# Origin@ Kottamalai peak (Periyar tiger reserve)- Idukki



## CHINNAR SUB-BASIN AND ITS RIVER NETWORK

		0.30.0.1	76°300°E 77°00°E
		10.3	Chinnar Sub-Basin N
Chinnar River UID Code: 15KL556R62807101			
River Length (km)	58.32	10-0'0"N	Julian San San San San San San San San San S
Basin Area (km²)	405.34	100	
Number of Named Rivers	5		
Number of Unnamed Rivers	1309		The state of the s
Length of Named Rivers (km)	101.1	9,30,0"N	Legend — Chinnar River — Named Rivers
Length of Unnamed Rivers (km)	940.73		River Network — Periyar River Chinnar Sub-Basin
		-	Periyar River Basin 0 5 10 20 30 40 Klometers 77:00°E

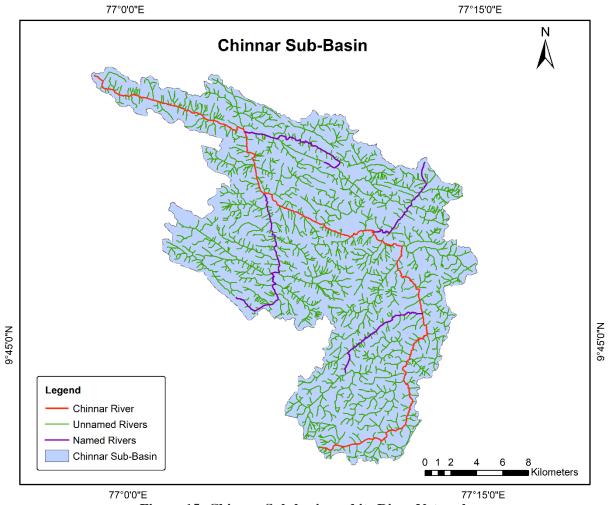
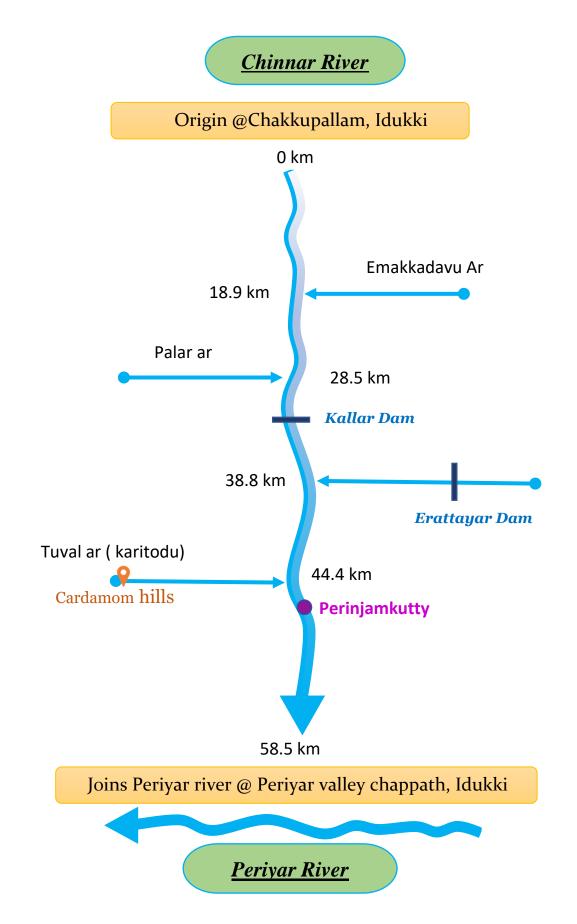


Figure 15: Chinnar Sub-basin and its River Network

## CHINNAR RIVER MAIN STEM FLOW DIAGRAM



## MUTHIRAPUZHA SUB-BASIN AND ITS RIVER NETWORK

		_		76"30"0"E	77°0'0"E	77*30'0
			_	Muthirapuzi	na Sub-Basin	Й
Muthirapuzha River UID Code: 15KL556R62805415						
River Length (km)	57	z		S many		
Basin Area (km²)	734.4	10°0°0"N	$\mathcal{W}$		At the second	
Number of Named Rivers	8					
Number of Unnamed Rivers	3626			¬		. Æ
Length of Named Rivers (km)	183.2	9°30'0"N	Legend  Muthirapuzha River  Named Rivers		The state of the s	"5
Length of Unnamed Rivers (km)	2271.3		River Network Periyar River Muthirapuzha Sub-Basin			}
			Periyar_River_Basin	76°30'0"E	0 5 10 20 30 77°0'0"E	40 Kilometers

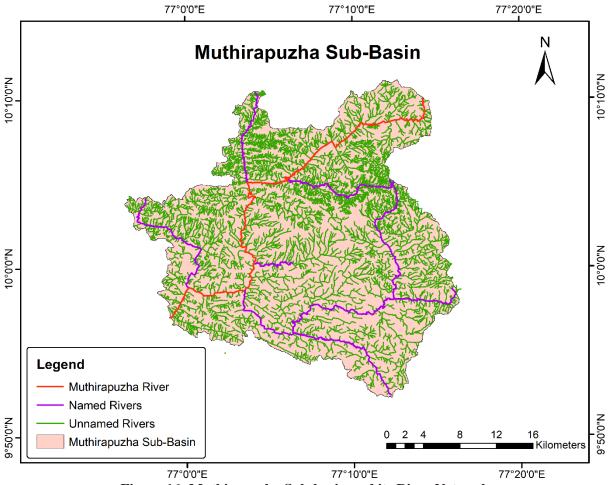
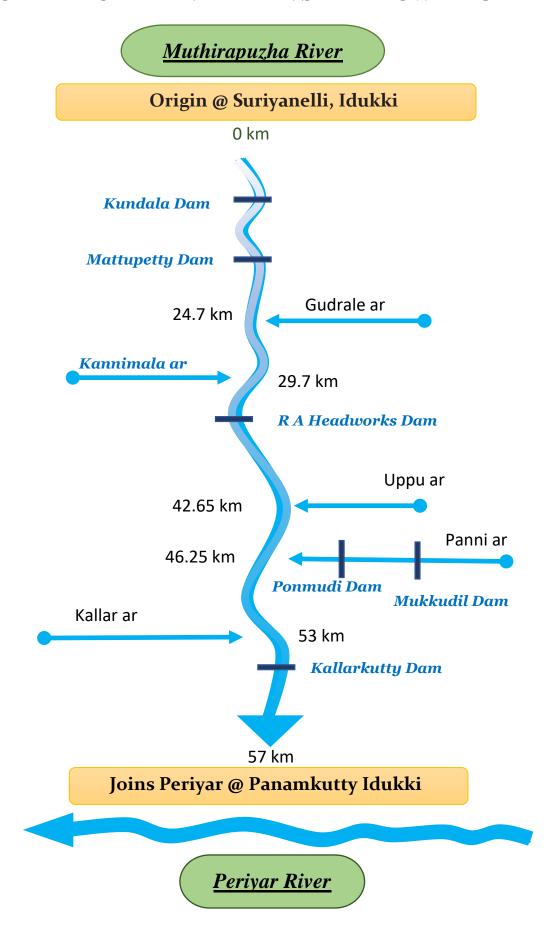


Figure 16: Muthirapuzha Sub-basin and its River Network

#### MUTHIRAPUZHA RIVER MAIN STEM FLOW DIAGRAM



#### DEVIAR SUB-BASIN AND ITS RIVER NETWORK

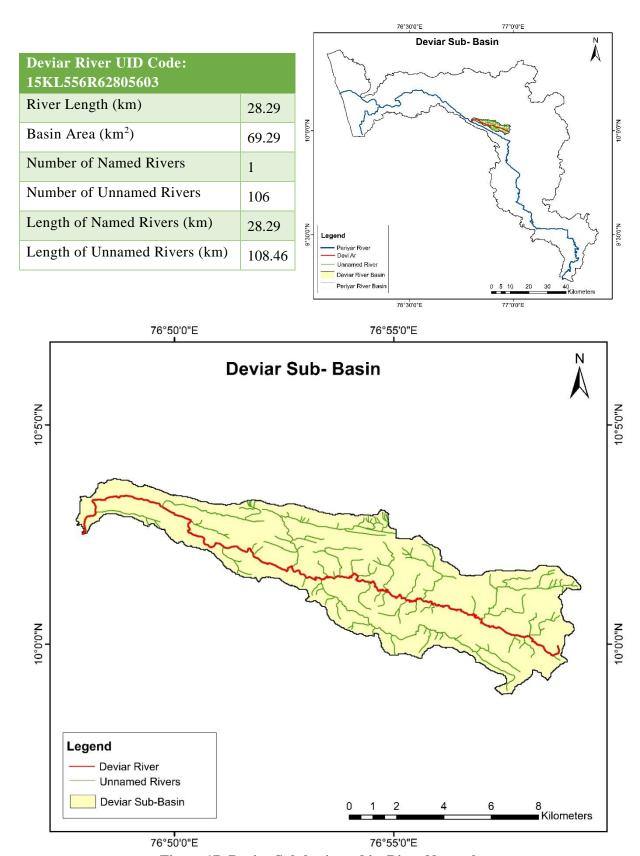


Figure 17: Deviar Sub-basin and its River Network

#### IDAMALAYAR SUB-BASIN AND ITS RIVER NETWORK

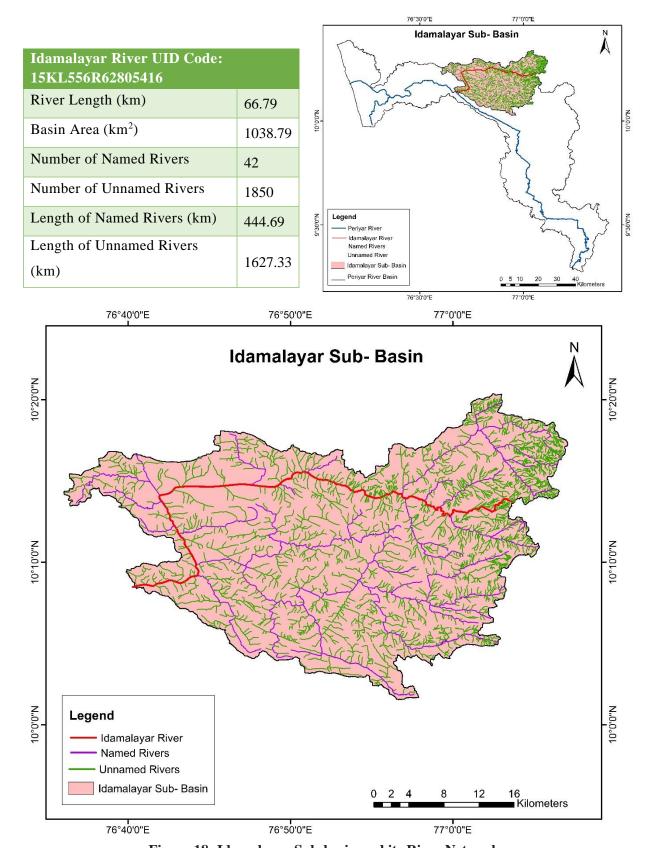


Figure 18: Idamalayar Sub-basin and its River Network

# Idamalayar River Origin @ Anamalai Hills, Idukki 0 km Nadalkal Ar 10.09 km Itili Ar 12.5 km Karinandu Todu 15.2 km Manali Ar 17.71 km Kallar 18.35 km Nallamalai Ar 30.79 km Kaliman Todu 34.54 km Anamalai Ar 37.78 km Kulinirkal Todu 48.42 km Anaikayam Todu 49.27 km Idamalayar Dam Cherpuram Todu 52.46 km Cherpuram Todu/ Panchankuttu Todu 53.64 km Pooyamkutti Ar 57.66 km Kuttampuzha 59.05 km Joins Periyar @ Bhoothathankettu, Idukki Periyar River

#### PULLUT SUB-BASIN AND ITS RIVER NETWORK

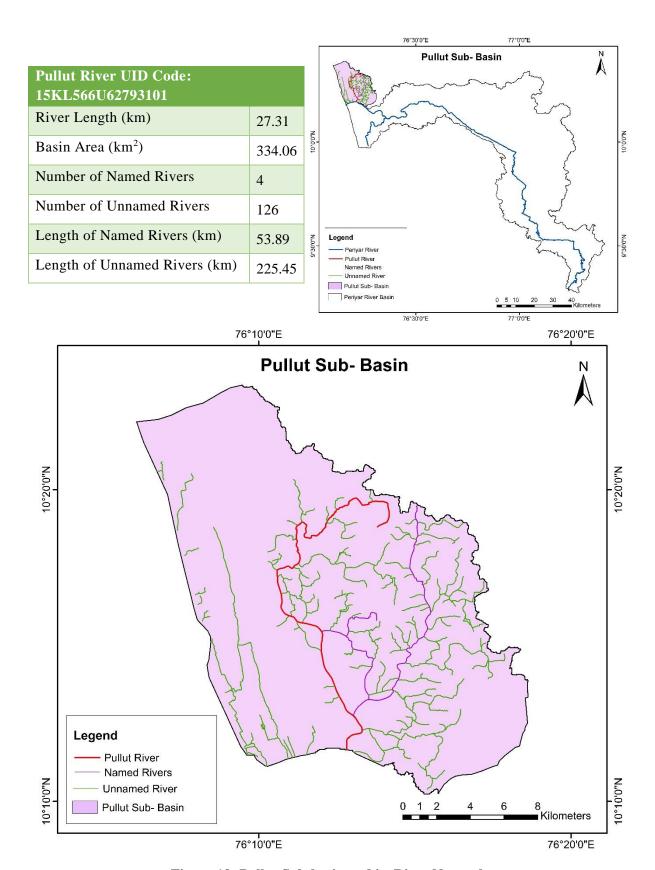


Figure 19: Pullut Sub-basin and its River Network

# **Pullut River**

# Origin @Mukundapuram, Thrissur

