

# Assessment of functionality status of household tap connections in rural areas (2020-21)

State report

**Kerala**



Submitted to:  
National Jal Jeevan Mission  
Department of Drinking Water and Sanitation  
Ministry of Jal Shakti

Report prepared by:  
NIELSEN (INDIA) PRIVATE LIMITED

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## **1. Introduction**

Announced in 2019, the Jal Jeevan Mission – Har Ghar Jal (JJM – HGJ) is implemented by Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti in partnership with States/ UTs. JJM aims to provide a Functional Household Tap Connection (FHTC) to every rural home in the country by 2024. A household tap connection is said to be functional when the tap water supply is of adequate quantity (minimum 55 lpcd) and prescribed quality (as per BIS:10500) on regular and long-term basis. Further, JJM seeks to promote holistic management of local water sources and not just provide tap water connections.

The DDWS had engaged Nielsen (India) Private Limited to undertake 'Functionality Assessment' of household tap connections. The assessment covered household tap connections in 6,992 villages across 704 districts from 31 States/ UTs. The survey was undertaken in November – December 2020.

## **2. Objectives of the study**

The main objectives were an assessment of Functionality of Household Tap Connections (FHTCs) under JJM on various parameters; ascertaining, in the form of data, on-ground progress of JJM in terms of adequate quantity of prescribed quality of drinking water supplied to rural households on regular basis; and engaging with Gram Panchayats and/ or its sub-committees of the sample villages and soliciting their feedbacks and recommendations for improving the programme implementation; and to suggest measures for mid-course correction for improvement in functionality of household tap connections.

## **3. Approach and Methodology**

The approach followed was to assess the functionality of household tap connections (within premises) and in-village drinking water supply infrastructure. The selection of sample villages was from the JJM-Integrated Management Information System (IMIS) data-base of villages having at least 15 household tap connections. In each sample village, the largest PWS scheme was sampled. The survey was planned as in-person Computer Aided Personal Interview (CAPI) survey, and included an on-ground assessment of the functionality of sample PWS schemes and tap connections attached to the same. The survey included measurement of the quantity of water received at the household level through the tap connection, as well as water testing to check whether the quality of the drinking water is as per the BIS standards, using Field Test Kits (FTKs) and H<sub>2</sub>S vials. The study also collected supply side information, including assessment of the quantity of water supplied by the scheme, operation and maintenance arrangements, availability and functionality of scheme level infrastructure and the aspects related to source and system sustainability.

A sample of 10 villages from every district in the State were selected following probability proportionate to size (PPS) systematic random sampling method ensuring due representation of SC/ SC majority villages as well as quality-affected villages. In each selected village, households for the survey were selected at head end, middle and tail end of the selected piped water supply network. In Kerala the survey was conducted in 2081 households from 140 villages in 14 districts.

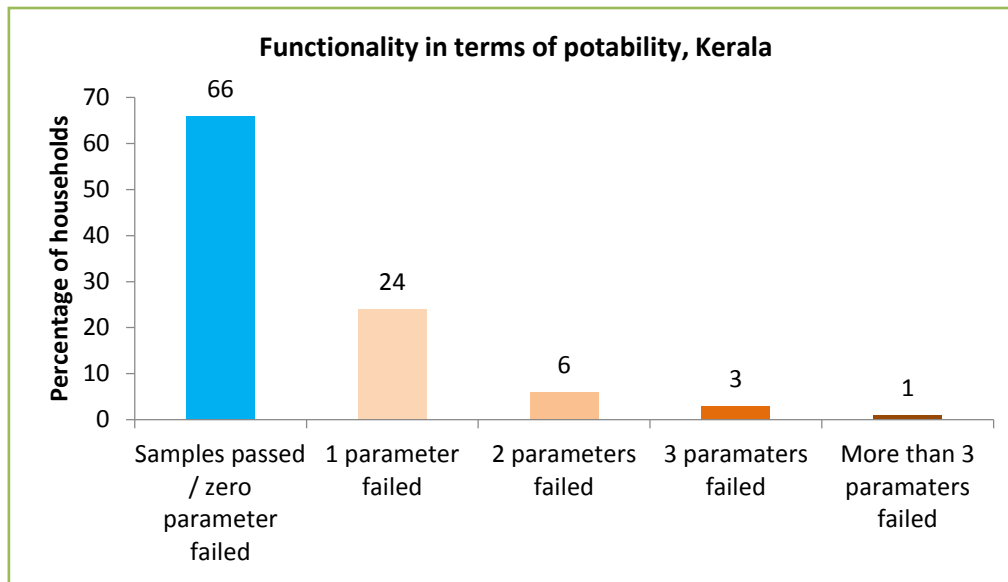
#### 4. Key Findings

SL.	INDICATOR	Kerala	India
<b>Household level</b>			
1	Average household size	4.2	5.6
2	Percent of households using FHTC for drinking purpose	94.5	88.9
3	Percentage of households reported working tap connections (supply at least one day in last 7 days)	90.2	93.6
4	Number of water supply days in a usual week		
4a	1 – 2 days	15.0	7.6
4b	3 – 4 days	19.2	10.4
4c	5 – 6 days	3.4	1.5
4d	7 days	62.3	80.5
5	Number of water supply days in the last week		
5a	0 days	0.5	2.4
5b	1 – 2 days	18.2	9.7
5c	3 – 4 days	24.2	14.8
5d	5 – 6 days	11.0	4.9
5e	7 days	46.1	68.1
6	Percentage of households reporting reliability of water supply days	80.9	86.5
7	Percentage of households reporting tap connections functioning continuously for more than 15 days in a month for last 12 months	84.1	84.6
8	Average number of times water is supplied on the days of supply		
8a	1 time	64.0	56.6
8b	2 times	4.8	28.2
8c	3 times	0.2	6.1
8d	4 times/24 hours	31.0	9.1
9	Percentage of households reporting reliability of supply for different supply timings	77.7	84.3
10	Percentage of households reporting adequate water pressure for different supply timings		
10a	Morning	82.7	80.1
10b	Afternoon	73.2	84.6
10c	Evening	62.8	84.8
11	Percentage of households reported paying water tariff – separately or along with other taxes	93.2	52.8
12	Percentage of households reported receiving 55 lpcd or more	94.5	83.5
13	Percentage of households having potable water *	65.5	61.3
14	Percentage of households reporting regularity of supply	81.1	87.2
15	Percentage of households reporting functional tap connections	49.9	47.8
<b>Village level</b>			
16	Percentage villages having functional water and sanitation committees	22.1	48.5
17	Percentage of functional schemes in the sample villages considering all schemes (supplying water any day in the last 7 days)	96.9	86.0
18	Percentage of in-village schemes having O&M undertaken by village water and sanitation committee or by Panchayat	77.4	83.1

SL.	INDICATOR	Kerala	India
19	Percentage of sample schemes reported having faced challenges in the last one year		
19a	Inadequate infrastructure	38.5	40.2
19b	Poor water availability at the source	37.6	33.0
19c	Poor maintenance	52.1	46.2
19d	Natural calamity	87.2	63.4
20	Percentage of schemes reporting measure to improve source sustainability	56.4	59.9
21	Number of sample villages found with no scheme (defunct/under construction/not handed over/not constructed)	0	751

Figures 1, 2 and 3 depicts the functionality aspects of the household tap connections in Kerala. Figure 1 presents the details of the potability aspects – the proportion of samples which have qualified as per all 13-15 parameters, as well as the proportion of sample which have failed due to one/two/three/more than three parameters.

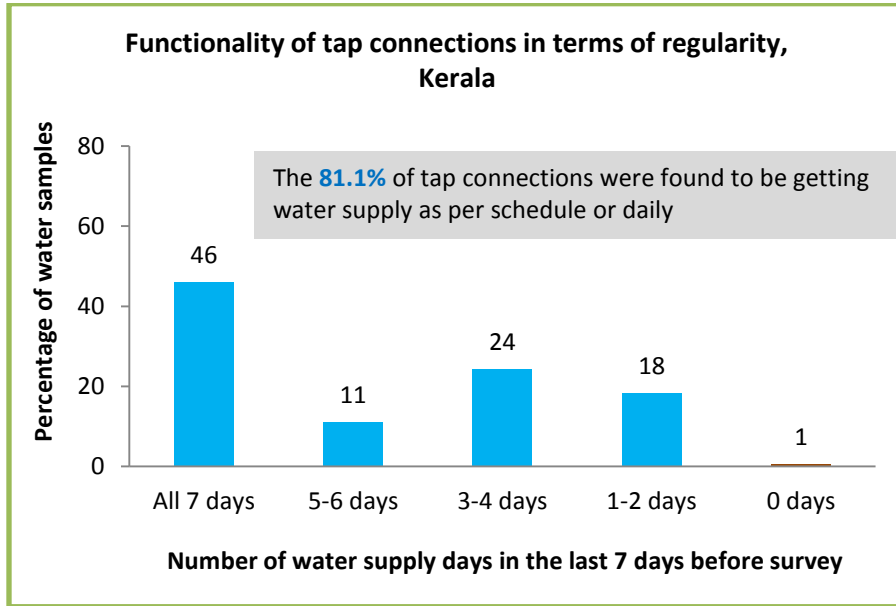
**Fig 1: Functionality of the household tap connection in terms of potability - Kerala**



**Base: Households with water quality testing done, N: 139**

Figure 2 presents functionality in terms of regularity, and presents the water supply situation in the last 7 days (before survey date). This includes information on the proportion of taps supplying water on all 7 days, 5-6 days, 3-4 days, 1-2 days and zero days in the last 7 days. As not all schemes are planned to supply water daily, the information of the proportion of taps supplying water daily or as per the water supply schedule is also presented.

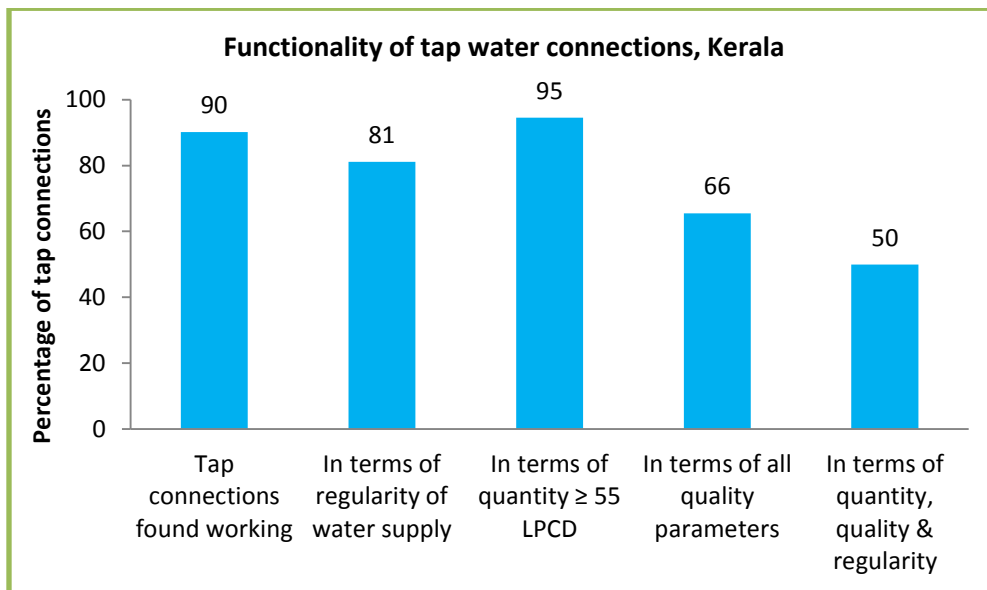
**Fig 2: Functionality of the household tap connection in terms of regularity - Kerala**



**Base: All Households, N: 2080**

Figure 3, presents the summary situation of the working tap connections (defined as supplying water atleast on one day in the last 7 days), the functionality in terms of the proportion of tap connections which have qualified regularity, quantity, quality parameters, and the proportion which have qualified all 3 parameters.

**Fig 3: Overall functionality of the household tap connection – Kerala**

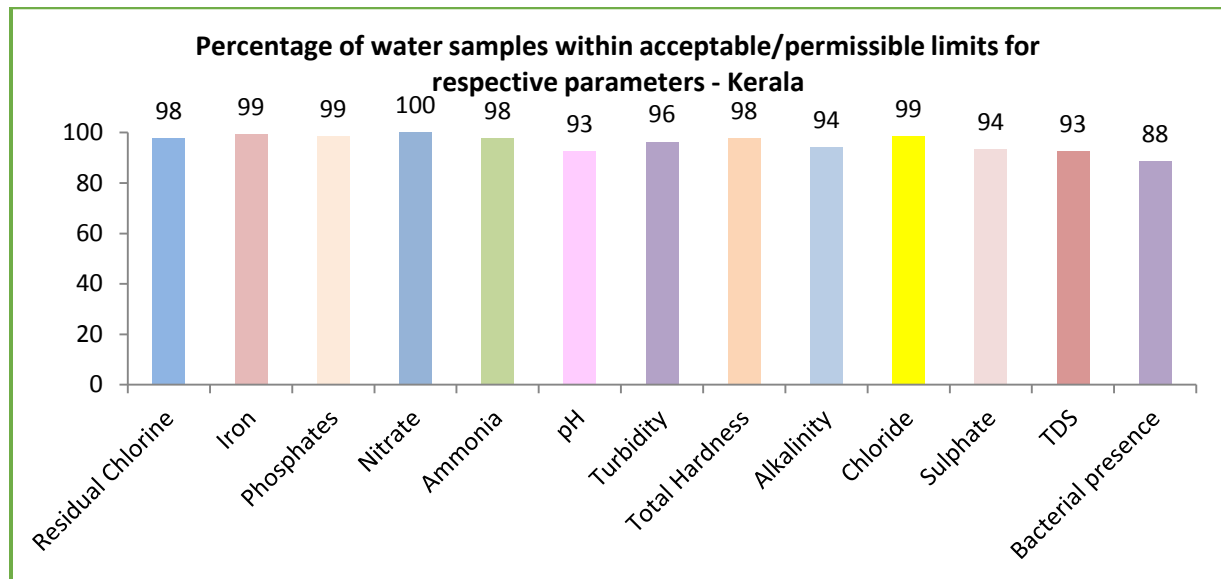


**Base: Total count of tap connections considered for functionality assessment, N: 2044**

A total of 139 water samples were tested as per BIS: 10,500 standards for all 13 parameters. The figure below shows the proportion of samples in which different parameters were found within acceptable/ permissible limits.

As can be seen, almost all the samples (98% or more) had Residual Chlorine, Iron, Phosphates, Nitrate, Total hardness, Ammonia, and Chloride within acceptable/ permissible limits. Bacterial presence (total coliform), pH and Alkalinity were the key issues.

**Fig 4: Percentage of water samples within acceptable/permissible limits for respective parameters - Kerala**



**Pic 1: Household survey being undertaken in one of the villages in Kerala**



**Pic 2: Water quality sample testing being undertaken in a village in Kerala**





## 5. Conclusions

Kerala has performed comparatively well in the functionality assessment (49.9%) as compared with the national average. A very high proportion (95%) of tap connections are estimated to supply more than 55 lpcd or more water and about 81 percent of tap connections were found to be supplying water daily or as per schedule. However, the proportion of households receiving potable water is less - about 66 percent. Since the tap connections considered to be functional were as per the JJM guidelines of including adequate quantity (55 lpcd or more), potability (as per BIS:10500 standards) and regularity of water supply (all days or as per the water supply schedule), the reason that a lower proportion of households had functional tap connections is mostly due to the lower proportion of households having a combination of regularity and potability (62% households having adequate quantity and potable water; 52% households having potable water received on a regular basis; while 77.6% households had adequate quantity of water supply on a regular basis).

The main issues with the samples which were not found potable were bacteriological presence (total coliform) being above permissible limits.

The proportion of households reporting currently working tap connections in Kerala is high (90%). On a usual basis, almost 62 percent of the households have reported receiving water supply on a daily basis. Nearly two third of the households have reported being supplied water once a day, and nearly one-third of them reported supply of four times or 24 hours supply. While 78 percent of the households have reported a reliability of water supply timings, around four-fifth of the households surveyed reported adequate water pressure.

In Kerala 93 percent of the households surveyed reported paying water charges. As per the JJM guidelines, the State Government needs to ensure 100% fund requirement for operation and maintenance of the schemes are met by the Agency responsible for water supply provision to function as a utility. With a little more effort Kerala can achieve the goal of 100% beneficiaries contributing to the O&M cost.

Slightly more than a fifth of the villages have reported having water and sanitation committees – of these villages, three-fourth of the water and sanitation committees were actually taking responsibility for operation and maintenance activities of the PWS schemes. As reported by the communities ‘poor maintenance’, and ‘natural calamities’ were the main challenges faced by the schemes. Slightly more than half of the schemes had taken any initiatives for source sustainability.

### **Annexures to this report includes:**

- List of villages with schemes supplying only through tap stand/stand posts is placed as Annexure 2,
- Indicative proportion of functional tap connections by districts is placed as Annexure 4, and
- List of villages where samples failed for given quality parameter is placed as Annexure 5

**Annexure 1: List of village with no scheme/defunct schemes/under construction**

No villages present with no scheme/defunct schemes/under construction.

**Annexure 2: List of villages with schemes supplying only through tap stand/stand posts**

S.No	District name	Block name	Panchayat name	Village name	Name of largest scheme in the village	Type	Remarks
1.	Alappuzha	Veliyanad	Neelamperoor	Kavalam	Kuttanadu Water Supply Scheme Phase II	MVS	No FHTC. Water supply through tap stand only

**Annexure 3: List of villages where 15 FHTCs were not found**

No villages present where 15 FHTCs were not found.

**Annexure 4: Indicative proportion of functional tap connections by districts**

S.No.	Districts	Percentage Functional Taps
1.	Alappuzha	25.4
2.	Ernakulum	81.3
3.	Idukki	65.3
4.	Kannur	44.6
5.	Kasaragod	61.2
6.	Kollam	82.7
7.	Kottayam	60.7
8.	Kozhikode	8.1
9.	Malappuram	42.7
10.	Palakkad	43.6
11.	Pathanamthitta	35.6
12.	Thiruvananthapuram	11.3
13.	Thrissur	57.2
14.	Wayanad	71.8

**Annexure 5: List of villages where samples failed for given quality parameter**

S.No.	District name	Block name	Gram panchayat name	Village name
<b>Villages with failed water samples for Turbidity test</b>				
1.	Alappuzha	Harippad	Thrikkunnapuzha	Thrikkunnapuzha
2.	Malappuram	Areecode	Urngattiri	Urungattiri
3.	Malappuram	Perumthalmanna	Aliparamba	Aliparamba
4.	Palakkad	Alathur	Kannambra	Kannambra-I
5.	Palakkad	Malampuzha	Malampuzha	Malampuzha-li
<b>Villages with failed water samples for pH test</b>				
1.	Idukki	Elamdesam	Velliyamattom	Arakkulam
2.	Kannur	Irikkur	Kuttiyattoor	Kuttiattoor

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S.No.	District name	Block name	Gram panchayat name	Village name
3.	Kannur	Peravoor	Kolayad	Vekkalam
4.	Kottayam	Erattupetta	Poonjar Thekkekara	Poonjar Nadubhagam
5.	Kottayam	Kaduthuruthi	Njeezhoor	Njeezhoor
6.	Malappuram	Kondotty	Chelembra	Chelambra
7.	Malappuram	Kuttipuram	Irimbilyam	Irimbilyam
8.	Malappuram	Ponnani	Thavannur	Tavanur
9.	Thrissur	Mala	Poyya	Poyya
10.	Thrissur	Vadakkamchery	Thekkumkara	Manalithara
<b>Villages with failed water samples for Total Hardness test</b>				
1.	Malappuram	Ponnani	Thavannur	Tavanur
2.	Thrissur	Chalakkudy	Meloor	Melur
3.	Thrissur	Vadakkamchery	Thekkumkara	Manalithara
<b>Villages with failed water samples for Total Alkalinity test</b>				
1.	Malappuram	Kondotty	Chelembra	Chelambra
2.	Malappuram	Ponnani	Thavannur	Tavanur
3.	Palakkad	Mannarkkad	Karimba	Karimba -li
4.	Thiruvananthapuram	Nemom	Maranalloor	Maranalloor
5.	Thiruvananthapuram	Vamanapuram	Kallara	Kallara
6.	Thiruvananthapuram	Vellanad	Kattakada	Kulathummal
7.	Thrissur	Mala	Poyya	Poyya
8.	Thrissur	Vadakkamchery	Thekkumkara	Manalithara
<b>Villages with failed water samples for Chloride test</b>				
1.	Malappuram	Ponnani	Thavannur	Tavanur
2.	Thrissur	Vadakkamchery	Thekkumkara	Manalithara
<b>Villages with failed water samples for Ammonia test</b>				
1.	Ernakulam	Alangad	Alangad	Alangad
2.	Pathanamthitta	Mallappally	Mallappally	Mallappally
3.	Thrissur	Chalakkudy	Meloor	Melur
<b>Villages with failed water samples for Phosphate test</b>				
1.	Ernakulam	Alangad	Alangad	Alangad
2.	Idukki	Elamdesam	Velliyamattom	Arakkulam
<b>Villages with failed water samples for Residual Chlorine test</b>				
1.	Kottayam	Kaduthuruthi	Njeezhoor	Njeezhoor
2.	Palakkad	Sreekrishnapuram	Vellinezhi	Vellinezhi
3.	Thrissur	Chalakkudy	Meloor	Melur
<b>Villages with failed water samples for Iron test</b>				
1.	Alappuzha	Harippad	Thrikkunnappuzha	Thrikkunnappuzha
<b>Villages with failed water samples for Sulphate test</b>				
1.	Palakkad	Mannarkkad	Karimba	Karimba -li
2.	Thiruvananthapuram	Athiyannoor	Kanjiramkulam	Kanjiramkulam
3.	Thiruvananthapuram	Chirayinkil	Kadakavoor	Kizhattingal
4.	Thiruvananthapuram	Kilimanoor	Navaikulam	Kudavoor

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S.No.	District name	Block name	Gram panchayat name	Village name
5.	Thiruvananthapuram	Nedumangad	Panavoor	Panavoor
6.	Thiruvananthapuram	Nemom	Maranalloor	Maranalloor
7.	Thiruvananthapuram	Perumkadavila	Perumkadavila	Perumkadavila
8.	Thiruvananthapuram	Vamanapuram	Kallara	Kallara
9.	Thiruvananthapuram	Vellanad	Kattakada	Kulathummal
<b>Villages with failed water samples for Total Dissolved Solids test</b>				
1.	Kozhikode	Balusseri	Balusseri	Balusseri
2.	Kozhikode	Chelannoor	Kakkodi	Kakkodi
3.	Kozhikode	Koduvally	Kodenchery	Kodenchery
4.	Kozhikode	Koduvally	Thamarassery	Raroth
5.	Kozhikode	Kunnamangalam	Karassery	Kakkad
6.	Kozhikode	Kunnamangalam	Mavoor	Mavoor
7.	Kozhikode	Melady	Keezhariyur	Keezhariyur
8.	Kozhikode	Permbra	Koothali	Perambra
9.	Malappuram	Ponnani	Thavannur	Tavanur
10.	Thrissur	Vadakkamchery	Thekkumkara	Manalithara
<b>Villages with failed water samples for Bacteriological present/ absence test using H2S vials</b>				
1.	Alappuzha	Aryad	Mararikulam(S)	Pathirappally
2.	Alappuzha	Baranikkavu	Thamarakkulam	Thamarakkulam
3.	Alappuzha	Chengannoor	Cheriyanaad	Cheriyanaad
4.	Alappuzha	Harippad	Thrikkunnapuzha	Thrikkunnapuzha
5.	Alappuzha	Pattanakkadu	Aroor	Aroor
6.	Alappuzha	Thykkattussery	Arookutty	Arookuty
7.	Idukki	Elamdesam	Kodikkulam	Kudayathoor
8.	Idukki	Elamdesam	Velliyamattom	Arakkulam
9.	Palakkad	Attappady	Sholayur	Sholayur
10.	Palakkad	Mannarkkad	Karimba	Karimba -li
11.	Pathanamthitta	Elamthoor	Kozhencherry	Kozhenchery
12.	Pathanamthitta	Konni	Thannithodu	Thannithode
13.	Pathanamthitta	Mallappally	Mallappally	Mallappally
14.	Pathanamthitta	Parakkode	Ezhamkulam	Ezhamkulam
15.	Pathanamthitta	Parakkode	Pallickal	Peringanadu
16.	Pathanamthitta	Ranni	Ranny-Perunadu	Perunad