

**PROPOSED PLANS IN CHALAKKUDY BASIN FOR HYDRO-ELECTRIC POWER
IMPROVEMENT and Flood Management**

Chalakkudi river is the 5th largest river in Kerala and the largest Hydro Electric Projects in Thrissur district viz Poringalkuthu and Sholayar are utilizing the water of Chalakkudy river for power generation. Poringalkuthu Left Bank Project, Sholayar HEP and Poringalkuthu Left Bank Extension are the completed projects with installed capacity of 36 MW, 54 MW and 16 MW respectively. The Sholayar and Poringalkuthu projects are interlinked and fed the state power grid. These two stations can also be operated as a separate group for supply of power to the Thrissur District and the nearby districts as well. This group of stations will be further strengthened when four other schemes in the chalakkudy basin are completed as envisaged in the old DPR. The salient features of the projects to be completed is as follows:-

Name of the Scheme As per DPR	Hight of the Dam above bed(Feet)	Storage in MCft	Gross Head (Feet)	Power Draft in (cusec)	Orginal installed Capacity (MW)	IC as of now (MW)	Enhancement@50%LF	Remarks
Poringalkuthu Left Bank	86	1130	600	580	32	52	24	Now we have 36MW(rennovated PLB)+16MW(PLBE)+24MW ongoing
Sholayar	189	5300	1050	380	54	54	0	Now Rennovation is going on
Poringalkuthu Right Bank	200	12000	800	800	90	0	140	70MW firm Power, means we can have 280MW with 25 percentage load factor
Vazhachalkuthu	Diversion		190	1800	46	0	46	23MW firm power , means we can have92 MW with 25 percentage load factor. Low head scheme.
Athirapilly	Diversion		450	1800	70	0	72	36MW firm power , means we can have 144 MW with 25 percentage load factor
Sholayar Tail Race(Anakayam)	75	1000	109	450	7.5	0	6.4	3.2MW firm power. Means we can have 12.8MW with 25% load factor

1. The Sholayar Tail-race Scheme

The original proposal:-

The Tail water level of Sholayar Scheme is +1500 ft. The FRL of the Poringalkuthu reservoir is +1391 ft. Hence power generation is possible by utilizing the tail race of Sholayar Scheme over the head of 109 ft. One of the tributaries of Anakkayamar has its bed level about +1425 and a 75 ft dam across this stream at the Anakkayam Kottai gorge raises the water to +1500 impounding about 600' long. Such a storage can be employed for more than one purpose – either can be considered as a pure diversion scheme or for pondage purpose.

If treated as a pure diversion scheme, the 450 cusecs of Sholayar tail water can generate about 3.2 MW of firm power before the waters enter the PLB reservoir. No penstock and tunnel is required and the power house can be located at the dam after lowering the tail water course to +1391 for a length of about 1000 ft.

Considered for pondage purposes, the reservoir can be operated for peak load purpose only.

This reservoir can also be considered for storage purpose alone, supplementing the L.B reservoir during deficiency period. It is obvious that constructing the Anakayam Kottai Dam with a height of 75' is hence a necessity rather than advantage be it considered for diversion, storage or peak load purposes.

Present Scenario :- Anakayam project is in tendering stage, but the project cost is more than 10 crore per MW due to various factors. If we can avoid the proposed long tunnels and make it a simple dam toe project, then this will converge for sure. This scheme shall be given importance so that adequate flow in to PLB may be ensured with 28.32MCM storage and can add more flexibility for SLDC operation.

2. The Poringalkuthu Right Bank Scheme

The original proposal:-

It is the highest capacity scheme out of the 4 recommendations. About 2.5 miles upstream of the present dam across the Chalakkudy river, a dam of 230 ft high above the bed level will impound about 18500 M.cft with full lake level at +1700. The bed level will be about +1470.

The drainage area above this dam would be about 342 sq miles and a continuous flow of 1200 cusecs is expected. A tunnel of 12000 ft long and a penstock of 1500 ft in length would be necessary to convey the waters to the generating station which could be located on the right bank.

The available head of about 875ft, hence it is expected to generate about **70 MW** of firm power. By far the biggest single generating station contemplated so far in this state, bigger than Jog Fall Scheme and Machkund, this scheme will cost roughly Rs 1000/Kw & odd lakhs at 1951 prices and take 7-8 years for completion.

Present Scenario :-

This project is need of the hour since this dam can store 523MCM of water. During flood 2018 we have seen enormous flood water endangering our land. This 523MCM will ensure a cushion for flood control for sure. There is no doubt on the potential of this dam considering the over topped condition of PLB dam. This Dam is required to ensure maximum discharge in Chalakudy River during deficient month and inflow for ATHIRAPILLY scheme. Without this project ATHIRAPILLY will be a costly effort for KSEBL.

3. Athirappilly H.E. Scheme

The original proposal:-

The tail waters from the right and left bank schemes which will be over 1800 cusecs with a possible head of 300 ft will give an output of **36 MW** of firm power.

Present Scenario :- This proposal had undergone lot of disputes in line with environmental issues. But the fact is this project will be viable only if Poringalkuthu Right bank scheme in place. Without PRB it cannot have 163MW for sure. Since we have pondage at PLB this scheme can be re-proposed with Trench Weir. A trench weir will ensure minimum submergence, no heavy dams and ensure study flow of river. This will not hamper the passage of animals or human. All the allegations raised by Chalakudy Puzha Smarakshana samithi may be resolved with this proposal of trench weir across the river. The dam toe power house is not required since the steady flow in to the waterfalls will be ensured with trench weir. We can have 144MW project with 25% LF considering the original proposal. The further studies to enhance it to 160 MW may also be done since hydro is the best renewable source.

4. Vazhachalkuthu H.E. Scheme

The original proposal:-

It is a low head scheme proposed to generate firm energy of 23 MW and the site is situated between Poringalkuthu and Athirappilly. A drop of 190' in the river at this site can be diverted to a Power house and generate 92MW with 25 % LF.

Present Scenario:

We can use trench weir concept in this proposal also. The current proposal of Athirappilly is only 163MW whereas Athirappilly and Vazhachalkuthu will ensure 236MW with 25 percentage Load factor. These proposals cannot hamper the environment.

Flood 2018 at Poringalkuthu Dam:-

The dam was overtopped on 16th August 2018 due to heavy rain. Analysing various data provided by CWC and our department the following observations are made.

- 1. The wachumaram diversion is supposed to carry the excess water from poringalkuthu reservoir in to Idamalyar. But this diversion was blocked completely due to accumulation of logs and other debris. So the chance of diverting the flood water in to Idamalyar has ceased. There is no gates to control the flood water in this interbasin interlink project.**
- 2. Design flood of Sholayar and Parambikulam is 1820 and 1687 cumecs respectively. Thunacadavu has a flood discharge of 500, means poringalkuthu shall have flood discharge capacity of 4007 cumecs and more to divert the flood water. But unfortunately the dam has only 2265 cumecs flood discharge capacity. The 1742 cumecs water will definitely has to take someother path and hence dam overtopped.**
- 3. All the dams in the upstream of poringalkuthu(upper and lower Sholayar, Parambikulam and Thunacadavu) discharged flood water in to this gravity dam. The dam withstood a similar issue in 1979. So this is not the first time and hence need intervention from top officials in this regard. The coordination with tamil nadu authorities is nee of the hour since Right bank project is not yet envisaged.**
- 4. Also PRB Scheme will play a major role in the flood management since it will be the biggest single generationg station recommended so far in chalakudy river. Moreover this Dam can**

impound 523 MCM water. The CWC recommended a new dam in the upstream of poringalkuthu for flood management. Hence this old proposal may be revisited rigorously for the people of KERALA.

Obesrevation made on irrigation purpose:

After the flood 2018 we have seen heavy draught in various places. To Tackle these issues we may have to ensure study inflow as part of PAP agreement. With these new/old proposals we can ensure an additional 1200cusecs in to Chalakudy River. As of now Tamilnadu is utilizing majority of our water resources. This year they have released only 120 MCM only, yet to release 96 MCM. With the PRB scheme these issues can be tackled to some extend.

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