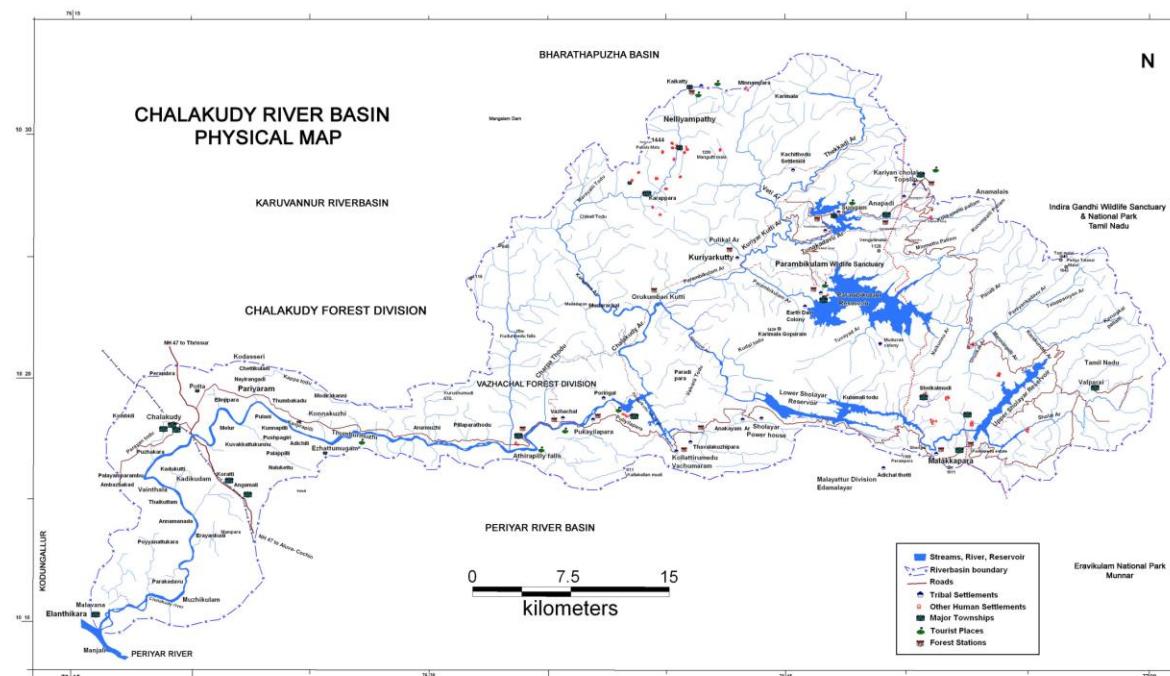


## Kerala Govt agrees to change operation of Chalakudy River Hydropower Project: Public pressure leads to changes in dam operation

The decision to increase off-peak generation at Poringalkuthu Left Bank Hydro Electric Project (PLB HEP) in Chalakudy River, taken at a meeting convened by the Hon Chief Minister of Kerala in the fourth week of April (PRD - Thrissur, 25-04-13) was a partial success to the sustained campaign for dams re-operation at Chalakudy river. The meeting was attended by the Ministers for water resource and power, River Basin MLAs and officials of state electricity board and irrigation department. The decision however falls short of the demand for reverting the operation of PLB HEP into base load.



Normally the summer water availability in the river below Poringalkuthu HEP should be between 1.3 - 1.5 MCM / day. The failure of both monsoons in 2012 and violation of Kerala-Tamil Nadu interstate Parambikulam - Aliyar agreement (1970) condition that the Kerala Sholayar reservoir shall be kept at full reservoir level by Tamil Nadu on the 1<sup>st</sup> of February every year (Sch. II.3 – PAP Agreement), reduced the water availability in 2013 summer to less than 1 MCM per day resulting in severe water stress in the river basin. On top of the water shortage, intra-day as well as inter-day flow fluctuations in tail-race discharge from PLB HEP had worsened the situation. Anticipating water shortage the river basin MLAs as well as Local Self Government (LSG) heads had been demanding action from the State Government since December 2012.

**The decision to increase off-peak generation at Poringalkuthu Left Bank Hydro Electric Project (PLB HEP) in Chalakudy River, taken at a meeting convened by the Hon Chief Minister of Kerala in the fourth week of April was a partial success to the sustained campaign for dams re-operation at Chalakudy river.**

**Background: The river – dams and flow regime** Chalakudypuzha (Chalakudy River), the fifth largest river in Kerala with a length of 144 kms and catchment area of 1704 Sq.kms is one of the heavily utilised rivers in the state. Major tributaries of this west flowing river originate from the Anamalai hills, Parambikulam Plateau and Nelliampathy hills of Southern Western Ghats. The river/ its tributaries have been dammed at six places. The dams and diversions have completely altered the natural hydrological

regime in the river. The river is the life line of about 30 Local Self Governments (LSGs) and about ten lakh people. Apart from the dams and diversion structures, numerous drinking water schemes and lift irrigation schemes are also dependent on the river. The table below provides details of existing major projects on the river.

#### Existing dams/ diversions in Chalakudypuzha

Sl. No.	Project	Commissioning Year	Purpose	Storage MCM	Developer
1	Poringalkuthu LB HEP	1957	Hydro Power	32	Kerala SEB
2	Thunakadavu (PAP)*	1965	Diversion	15.77	Tamilnadu
3	Kerala Sholayar (PAP)	1966	Hydro Power	153.49	Kerala SEB
4	Parambikulam (PAP)	1967	Diversion	504.66	Tamilnadu
5	Peruarippallam (PAP)	1971	Diversion	17.56	Tamilnadu
6	TN Sholayar (PAP)	1971	Hydropower + diversion	152.7	Tamilnadu
7	Chalakudy River Diversion Scheme	1959 **	Irrigation	0.218	Kerala-Irri Dept
8	Idamalayar Augmentation Scheme	1990s	Diversion	NA	Kerala SEB

\*PAP- Parambikulam Aliyar Project    \*\*Partially operational since 1952

Almost 75 percent of the catchments of the Chalakudy River were forested at the turn of 20<sup>th</sup> century.

**The High Level Working Group formed to look into the WGEEP report acted in a non-transparent manner. They conducted a field visit with the project proponent (KSEB), without informing the public, press or the Grama Panchayath and not providing opportunity for the organisations opposing the project to present their case.**

Hence the river had a fairly healthy flow even during summer months. However, at present, the natural summer flow in the river has reduced drastically due to forest degradation and dams and diversions. Consequently, the present river flow in non-monsoon months is almost entirely dependent on the storage at Kerala Sholayar and Poringalkuthu reservoirs. The downstream major irrigation project, the Chalakudy River Diversion Scheme (CRDS) does not have storage of its own. It is completely dependent on the tailrace discharge from the PLB – HEP. Over the last two decades, the daily flow fluctuation due to the semi-peaking operation of the PLB-HEP is affecting the functioning of CRDS. Incidentally, the campaign against the proposed Athirappilly

hydroelectric project (AHEP) had first brought this issue into focus. One of the major issues with regards to AHEP, a peaking power station, was the downstream impacts of drastic intra-day flow fluctuation (to the tune of 1:17).

Incidentally, Western Ghats Ecology Expert Panel had recommended not to give clearance to the project after conducting field visits and detailed and transparent consultations. However, the High Level Working Group formed to look into the WGEEP report acted in a non-transparent manner. They conducted a field visit with the project proponent (The Kerala State Electricity Board - KSEB), without informing the public, press or the Grama Panchayath and not providing opportunity for the organisations opposing the project to present their case before the committee. The HLWG recommended that the project proponent can approach the Ministry of Environment and Forest (MoEF) for fresh clearance, if it so desired, after some studies despite identifying the project location as ecologically sensitive area.

Analysis of hydrological data for AHEP as well as debates on the issue revealed the existing flow fluctuations due to changed operation pattern of PLB HEP since early 1990s. As the capacity of the PLB HEP was enhanced from 32 MW (8 MW X 4) to 48 MW with the commissioning of a 16 MW generator in 1999, the peak generation and the resultant flow fluctuation increased. The field assessment in the CRDS command area had confirmed the impacts due to the flow fluctuations.

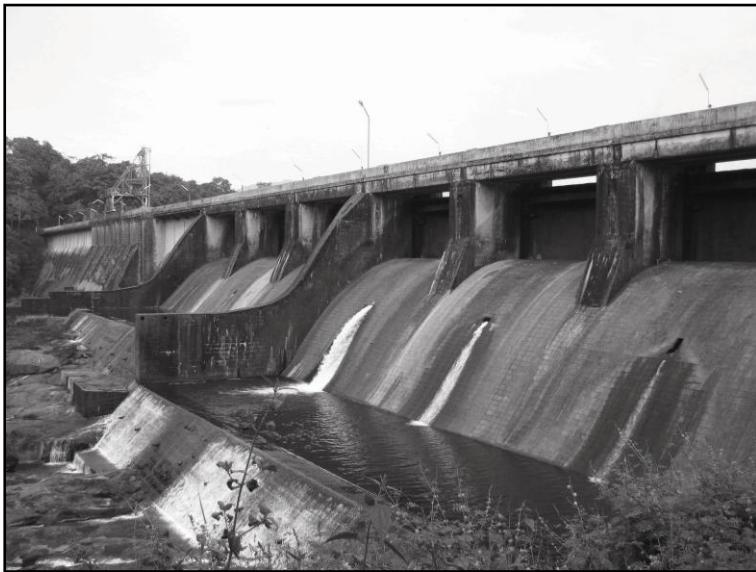
As part of an action research done by the Kerala State Centre of Forum for Policy Dialogue on Water Conflicts in India, an attempt was made to find possible solutions to the conflict of interest between power generation and downstream needs. The conflict between CRDS and other downstream uses due to total diversion of water at its head works at Thumboormuzhi was also taken up. An alternate reservoir

operations management (ROM) strategy that aims at sustainable and equitable sharing of available water resources was prepared as part of the study.

**At present the entire flow reaching Thumboormuzhi weir, the head works of CRDS is being diverted to the canals, except for some overflow during peak hours. This is affecting the downstream areas including the ecological functions of the Chalakudy river. The ROM strategy proposes a minimum flow of not less than 2 m3/sec to be released from Thumboormuzhi weir in to the river.**

**ROM strategy for Chalakudy River** The ROM strategy tried to synchronise the operations of Kerala Sholayar and PLB HEPs with the downstream requirements. Secondary data regarding the river flow, rainfall etc. was collected from concerned agencies like KSEB, Water Resources Department etc. Issues with respect to the present flow regime were assessed through field surveys and stakeholder consultations. After analysing the available data and assessing downstream irrigation needs through people's perception and based on the suggestions/ comments by the experts, the draft reservoir operations strategy was prepared. ROM strategy is attempted for water available to the basin after diversions to Tamil Nadu and Idamalayar with focus for non-monsoon months.

In the proposed ROM strategy, the summer water availability for the downstream needs is suggested to be increased through modifications in the operation pattern of Kerala Sholayar and Poringalkuthu HEPs. At Kerala Sholayar, the total utilisable quantity of water is fixed as per the PAP agreement. The monsoon discharge is proposed to be reduced by about 15 % of the average flow (data period - 1979 to 2006) so that the non-monsoon water availability can be enhanced. At Poringalkuthu, the ROM strategy proposes that the water level in the reservoir shall be kept at close to the full reservoir level up to the end of January. The change in the operation of the two HEPs is expected to ensure water availability of not less than 1.5 MCM/ day for the downstream uses. The ROM strategy proposes to operate the Poringalkuthu HEP, the lower dam, that discharges water into the main river as a base load station (as it was operated before 1990s) in non-monsoon months. This can ensure a steady discharge of over 17 m3/sec.



Peringal Dam: Photo source: CPSS

At present the entire flow reaching Thumboormuzhi weir, the head works of CRDS is being diverted to the canals, except for some overflow during peak hours. This is affecting the downstream areas including the ecological functions of the river. The ROM strategy proposes a minimum flow of not less than 2 m3/sec to be released from Thumboormuzhi weir in to the river. This may be increased later after improvement in natural summer river flow through eco-regeneration of the upper catchments and by reducing the irrigation demand through adoption of 'more crop per drop' approach in the CRDS command.

The revised operation pattern is not expected to have significant impact on the power front. The non-monsoon power generation from the river basin is expected to slightly increase, whereas, the peak power generation will be reduced by 8 MW to 16 MW, which is about 0.25-0.5 % of the present summer peak demand of Kerala of about 3400 MW.

**Building public awareness and public pressure** The ROM strategy was widely discussed with the LSGs and other stakeholders. As the LSGs, farmers and Irrigation and Agriculture departments were active partners in the action research (2008 – 2012) they readily accepted the proposed ROM strategy.

**The campaign / advocacy for further changes in operation will have to be continued as the present decision is of a temporary nature. Moreover, a collective of Local Self Government heads is emerging for the cause of the river and this collective, if it becomes active, can really help take forward the efforts for the revival of Chalakudy River.**

Many LSGs demanded the state government to implement this, through resolutions. With the shortage in rainfall during 2012 monsoons, severe water stress was anticipated and a series of steps were taken to put pressure on the state government for dams re-operation so that the summer water shortage for downstream areas can be reduced.

- A meeting of the LSG representatives organised by Chalakudy Puzha Samrakshana Samithi (CPSS) before the start of irrigation season discussed the anticipated scenario for the 2012-13 season and decided to step up campaign for changing the operation pattern at PLB HEP.
- The project advisory committee meeting of CRDS, in December 2012 also took a similar

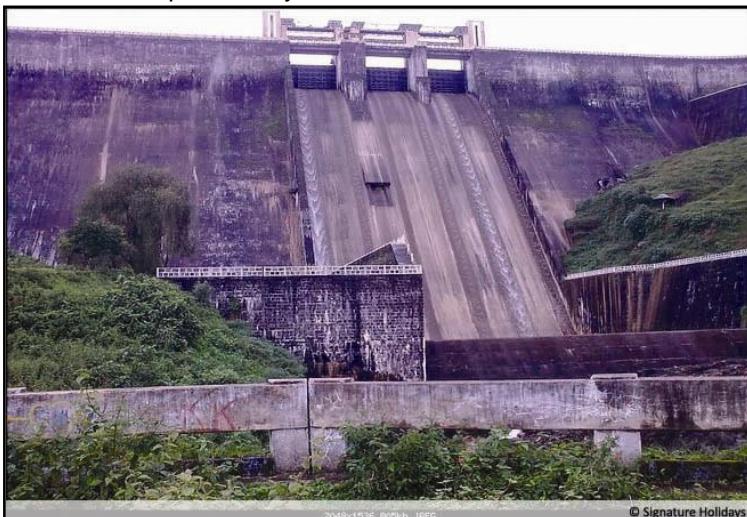
decision.

- In December 2012, five MLAs of the Chalakudy River basin, cutting across party lines, jointly demanded the Chief Minister to convene a meeting of the concerned ministers, MLAs, LSG heads and officials to discuss the issues with regards to the summer water availability in the river basin. This was the result of a series of interactions with these MLAs by the CPSS team.
- In the second week of January 2013, 25 LSG heads gave a submission to the CM demanding action by the government to ensure water availability at Kerala Sholayar as per the PAP agreement and changing the Poringalkuthu HEP to base load station.
- Even as no action was taken by the state government and the situation was becoming grim, the project advisory committee meeting of CRDS decided that a delegation must go to Thiruvananthapuram and meet the CM and other concerned ministers. A meeting of LSG heads organised jointly by CPSS and Chalakudy basin Block Panchayaths also decided to take necessary actions.
- On March 19<sup>th</sup> 2013, four MLAs and 10 LSG heads from Chalakudy River basin met the Chief Minister and Minister for Water Resources. Rajaneesh from CPSS was also part of the team. The people's representatives wanted the Govt to take necessary steps to ensure better water availability for Chalakudy basin. The main points raised were regarding violation of Parambikulam - Aliyar Agreement condition and ensuring steady flow from Poringalkuthu HEP for the downstream needs. The CM agreed to convene a meeting of all concerned immediately. However, the meeting was delayed by more than one month and when the meeting finally took place, the LSG representatives were not invited for the same.
- Meanwhile a detailed discussion was held with the KSEB Chairman in the first week of April 2013. The Chairman promised to look into the issue.
- All along the campaign, the print as well as visual media reported these developments and published / telecast stories on the issue.

**Partial re-operation** The daily average generation at Poringalkuthu in January 2013 was 0.4481 MU (Million Units, as per Kerala State Load Despatch Centre website) and the corresponding discharge was about 1.2 MCM per day. Due to the non-compliance of PAP agreement condition, the combined storage at Kerala Sholayar and Poringalkuthu reservoirs on the 1<sup>st</sup> February was only around 115 MCM against an anticipated volume of 160 -170 MCM. Consequently, the generation was less in the following months. The average generation and discharge in February, March and April were 0.3457 MU / 0.93 MCM, 0.3237MU / 0.87 MCM and 0.3343 MU / 0.9 MCM respectively. The semi-peaking operation at PLB HEP continued resulting in intra-day fluctuations. The off-peak generation was mostly limited to 8 MW with a corresponding discharge of around 6.5 m<sup>3</sup>/sec, which is highly insufficient to meet the irrigation demand of the CRDS command. There were also instances of practically no generation during off-peak hours, especially during night times.

Apart from the intra-day fluctuation the inter-day flow fluctuations was also a major cause of worry. The situation was particularly bad in the second half of March and first half of April. On 4 days between March

21st and April 10th, the generation was between 0.158 MU and 0.182 MU. The corresponding discharge was less than 0.5 MCM. On a few other days, the generation was between 0.2 -0.3 MU.



Upper Sholayar Dam Photo Source: CPSS

Since the decision of the meeting convened by the CM, the situation has slightly improved. The inter-day fluctuation was less since 25<sup>th</sup> of April with the discharge of 0.9 -1 MCM on most days. More importantly, the off-peak generation was at least 16 MW (except on a couple of days). The average discharge since the last week of April has also slightly increased in comparison to the previous months.

The change in operation pattern does not seem to have had any negative impact on power front. Initially the KSEB had increased off-peak generation without reducing peak generation. The generation figures as per the SLDC website shows the generation at PLB HEP on 25<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> April (after the decision at Ministry level meeting) as 0.425 MU, 0.402 MU and 0.412 MU respectively, corresponding to discharge of around 1.1 MCM. Later only one machine was available and the peak as well as total generation reduced. The average generation during this period was around 0.35 MU corresponding to a discharge of about 0.95 MCM. The generation figure shows that the station was running continuously as a base load station (by default?) for two weeks. Even though the rate of discharge was less than the actual requirement, we have requested the irrigation officials to assess the effect of steady inflow at CRDS.

The decision for increasing off-peak generation is significant since it is acknowledgement by the government that the downstream requirement should be given priority over power generation. However, the long delay in taking such a decision even after the river basin MLAs and LSG heads unanimously demanded for the same cannot be justified. Also, the steps taken so far are not sufficient. The storage position as on 27-04-2013 at Kerala Sholayar and Poringalkuthu reservoirs (33.78 MCM and 9.23 MCM respectively) could have supported a daily discharge of upto 1.3 MCM till May 31<sup>st</sup>, especially since the catchments traditionally get good pre-monsoon rains and an inflow of 100 cusecs from Tamil Nadu Sholayar was anticipated, on the basis of inter-ministerial discussion on PAP agreement.

The campaign / advocacy for further changes in operation will have to be continued as the present decision is of a temporary nature. Until and unless the non-monsoon discharge from Poringalkuthu HEP is enhanced to around 17 m<sup>3</sup>/ sec, sufficient river discharge from CRDS head works is not likely to materialise. (The suggested discharge rate from Poringalkuthu HEP as per the ROM strategy, based on anticipated water availability, is 17.25 m<sup>3</sup>/ sec and the corresponding generation will be 24 MW.) The fact that the Chalakudy MLA protested against closing down all generators of old powerhouse together since May 7<sup>th</sup> shows that the people's representatives are now more vigilant on the issue and this should help in stepping up the campaign. Moreover, a collective of Local Self Government heads is emerging for the cause of the river and this collective, if it becomes active, can really help take forward the efforts for the revival of Chalakudy River.

S P Ravi ([cholayar@rediffmail.com](mailto:cholayar@rediffmail.com))