

# Lohit Basin Study by WAPCOS: A mockery of e-flows and cumulative impacts

Looking at the standard of cumulative impacts assessment studies that are being churned out by organisations like IIT R and WAPCOS, it seems like 'Cumulative Impacts Report' will rapidly reach the same level of notoriety as that enjoyed currently by the EIA reports. Cumulative Impact Assessment Report or 'Basin Report' as it is called of Lohit Basin falls in the same category. In order for the report to be of any substantial use, it will need to be redone, with an emphasis on the development in the entire basin.

SANDRP wrote to the Expert Appraisal Committee, River Valley Projects who were supposed to discuss the Lohit Basin study which was commissioned to WAPCOS. Some of the major points raised in the SANDRP letter about the WAPCOS study were:

## Assessing impacts of projects on tributaries of Lohit

While the basin study looks at the impacts of 7 projects on the main stem, there are other six projects being developed on the tributaries which include: 98 MW Tiding – I, 68 MW Tiding – II, 96 MW Raigam, 21 MW Kamlang, 99 MW Gimliang, 75 MW Noa-Dihing.

As stated on page 1 of the basin study report, two of the four objectives of the basin study are:

- Review of existing and planned developments as per various developmental plans.
- Evaluation of impacts on various facets of environment due to existing & planned development.

Fulfilling these objectives is impossible without integrating impacts of these six large projects on the tributaries, on the hydrology, ecology and socio cultural scenario in the basin. On the contrary, the report makes assumptions like: "The migratory route of the fishes as such would be affected to some extent, but then the entire *river course is regularly drained by numerous inlets in forms of small rivers*, seasonal nallahs, channels, rivulets and like water sources where these fishes can get refuge during course of their migration to carry out their annual spawning/breeding activity."

**There is an urgent need to set criteria for preserving continuous free flowing stretches of optimum length of rivers which confirm with important ecosystems & socio cultural needs. For rivers like Lohit, which are free flowing, unregulated, unpolluted & supporting remarkably high biodiversity, we need to immediately decide to leave them in free flowing states.**

**SANDRP had written to the EAC about close distance between cascade projects on Jan 19, 2011. The issue was on agenda for the EAC meeting of Jan 21. But as per the minutes on the MoEF website, the issue was not discussed at all in that or any of the subsequent meetings and now EAC has been arbitrarily recommending a distance of 1 km. between two projects as some sort of a misguided standard.**

**Livelihood issues do not find a mention** Tribals in Lohit basin have been traditionally dependent on the river basin for ecosystem goods and services it provides. This includes subsistence fishing, floodplain farming, jhoom cultivation, gathering of medicinal and wild food plants, hunting gathering, etc. This crucial element does not find mention in either the individual EIAs or the basin study. At the same time, the report does not mention the impact of the projects, construction activities or submergence on places of religious importance (like Parsuram Kund), temples and local land holdings.

**Free flowing stretch of river** "According to the report: *With the construction of the proposed hydroelectric projects including Anjaw hydroelectric project, free flowing river shall be available from international boundary for a length of 42.4 km in a stretch of 144.2 km upto dam site of Demwe Lower HEP.*"

This gives an impression that the river flows freely for 42 km (there is no ecological justification for this, since free flowing length is broken into several small pieces and it does not make sense to add up such small pieces without assessing if the small lengths are sufficient for the river to regain its ecology). However, it is clear that 32 km of this is in the initial stretch from international boundary to submergence of Kalai Stage I project. From here on, the free flowing 'stretch' is **10.4 km of the 122.2 kms river length!**

**Submerged area, behind a reservoir cannot be considered as a 'free flowing river'<sup>1</sup> and stretches can be considered free flowing only if they adhere to e-flow releases. So, of the 122.2 kms stretch of the river downstream Kalai Satge I, hardly 8.5 % of river flows freely, that too in highly fragmented patches.**

<sup>1</sup> SANDRP had written to the EAC RVP about close distance between cascade projects on the 19<sup>th</sup> January 2011. The issue was supposed to be on agenda for the EAC meeting on the 21<sup>st</sup> January. But according to the minutes published on the MoEF website, the issue was not discussed at all in that or any of the subsequent meetings and now EAC has been arbitrarily recommending a distance of 1 km. between two projects as some sort of a misguided standard.

What sort of ecology and ecosystem goods and services can be supported by such severe fragmentation? All the migratory routes and spawning grounds of endangered fish like Trouts and Golden Mahseer (which cannot use the fish ladders effectively, even if they were to exist and to be operated, both of which are big question marks) will be destroyed.

There is an urgent need to set criteria for preserving continuous free flowing stretches of optimum length of rivers which confirm with important ecosystems and socio cultural sites. For rivers like Lohit, which are free flowing, unregulated and unpolluted with remarkably high biodiversity, endangered and supporting many schedule I species, we need to urgently decide to leave them in free flowing states.

Rivers of the north east are some of the last remaining free flowing rivers in the country, which support unique biodiversity, endangered species and communities. There is an urgent need to protect the free flowing character of these special rivers for the benefit of future generations. The North Eastern States, UN bodies, communities, environment groups and MoEF should be proactive in this respect and should set a bench mark in protecting free flowing status of important rivers, like many countries have already done.

**Environmental Flows** *The section on environmental flows appears to be most critical and unfortunately, the weakest section of the study. The report states:*

**For Kalai I** Downstream stretch of river from the dam site will remain dry for a period of 16 to 19 hours, which will be followed by a continuous flow equal to rated discharge of 1033 cumecs for a period of 5 to 8 hours.

**Kalai II** In lean season river water will be stored for a period of 15-20 hours. As a result, downstream stretch of river from the dam site will remain dry for that period. This will be followed by a continuous flow of 1112.27 cumecs (rated discharge) for a period of 4 to 9 hours.

**Hutong I** In lean season, river water will be stored in the reservoir for 17-21 hours, the river will remain dry for the corresponding period downstream of dam site. This will

be followed by a continuous discharge of 1423 cumecs (rated discharge) for a period of 3 to 7 hours.

**Hutong II** In lean season, water will be stored for 17-21 hours, resulting in drying

So, of the 122.2 kms stretch of the river downstream Kalai Satge I, hardly 8.5 % of river flows freely, that too in highly fragmented patches. What sort of ecology and ecosystem goods and services can be supported by such severe fragmentation? All the migratory routes and spawning grounds of endangered fish like Trouts and Golden Mahseer (which cannot use the fish ladders effectively, even if they were to exist and to be operated, both of which are big question marks) will be destroyed.

of river Lohit downstream of dam site. This will be following by a continuous discharge of 1423 cumecs for a period of 3 to 7 hours.

**Demwe Upper Project** The river flow will be used to fill up the reservoir in lean season for 14-19 hours, the river will remain dry for this period. This will be followed by a continuous discharge of 1513 cumecs for 5 to 10 hours.

**Demwe Lower** In lean season the river will remain dry for an average of 10 to 19 hours followed by 5 to 14 hours of design discharge

(1729 cumecs).

Considering the massive impacts of this drying and flooding regime on the ecology and communities in the downstream, it is imperative to have a sound e-flows assessment and implementation for the Lohit River.

Unfortunately what we find is: The basin study states too many methodologies and how they are used, **without clearly concluding on any methodology**. It does not clearly state the data available for Lohit, the data constrains and most importantly, the **objectives** for setting a certain e-flows regime. For nearly all the methodologies, the crucial part is the objectives being set. In the absence of stated objectives, it is seen that the study **makes some wrong assumptions**.

**Tennant Method:** Section 9.4 begins with: **“Assume fair and degrading conditions prevail in the basin”**. **On what basis can this assumption be made?**

Through this assumption, very low e-flows, to the tune of 10% Average annual flows in lean season and 30% in April-September have been prescribed. The report itself states that Lohit basin has low pollution, good water quality, high proportion of endemic and endangered species and is completely free flowing as of now. So what is the justification of calculating e-flows which are tailored for a degrading river and lead to a degraded river? This assumption is clearly unacceptable.

**Hughes & Munster Method** Hughes & Munster method assesses e-flow requirements based on the

environmental category of the river (from A to D). Category selected for Lohit is not clear. Actually, it is unclear if the method followed in Hughes & Munster or Smakhtin (2004) for which no reference is found in the report.

**Index Method** According to the Index method:

Mean Instream Flow  
(MIF) =  $Q355 * k_a * k_b * k_c$

According to Lohit river basin study:  $K_a = 0.7$

because the report states:

**“River ecology is very sensitive”**

Actually, according to Maran’s original paper on Index Method, the range for  $K_a$  is between 0.7 to 1, depending on the river and ecology. **So 0.7 factor actually indicates the lowest range of ecological sensitivity!**

$K_b = 0.25$  “River is in a natural state therefore any implementation factor is required.” Actually,  $k_b$  indicates the gradual time application norm (which goes on from 0.25 to 1), as e-flows cannot be increased rapidly for an already modified basin, **but we are talking about a free flowing river here and not a modified river so factor of 1 needs to be used.**

$K_c$  Ranges from 1 to 1.5, depending on the different nature of protection in different stretches of the river (for example for a protected area). **This is again taken as one, lowest on the scale.** Looking at the flawed assumptions, the conclusions arrived at using them cannot be credible.

Only 3 methods: Tenant, Hugh & Munster & Index are considered by the report. We saw some of the short comings & faulty assumptions made in using these methods. Even more surprisingly, the Final Proposed ‘Minimum’ Flow (Table 9.16) is not based on any of these methods! Neither is the methodology used for arriving at the result indicated! Looking at the far reaching implications of e-flows in Lohit basin on ecology and communities in the upstream as well as the downstream till Assam, there is an urgent need to rework the e-flows section, set objectives based on the pristine state of the river and use a globally accepted methodology, through a transparent and participatory process.

E-flows need to address not only the seasonal variations, but the diurnal fluctuations as well as they are huge. For example, the daily fluctuation in Lower Demwe in the month of February between 88 cumecs and 1729 cumecs will still be ecologically disastrous for ecologically sensitive habitats in the downstream as is obvious from existing global literature on the impacts of peaking hydropower projects.

This highlights the need for e-flows and not ‘minimum flows’ indicated in the study. There is a need for assessing and maintaining real time (hourly) natural flow patterns of the river in the undammed state in order to

mitigate some of the impacts of peaking in order to maintain ecological integrity of the very sensitive ecosystems, as well as livelihood security in the downstream. Massive daily flow fluctuations between 35 cumecs and 1729 cumecs (or for that matter 88 cumecs and 1729 cumecs) cannot be described as e-flows.

**Cumulative Impacts not assessed**

An important component of the basin study should be to assess

the ‘Cumulative Impacts’ of all the projects in the basin which go beyond individual impacts. However, no such attempt has been made in Lohit Basin Study. Specifically, some of the cumulative impacts that the report has not assessed include:

1. Changes in sedimentation at various points within project, at various points within a day, season, year, over the years and cumulatively across the basin and impacts thereof.
2. Cumulative impact on aquatic and terrestrial flora and fauna across the basin due to multiple projects.
3. Cumulative impact on hydrological flows, at various points within a project, at various points within a day, season, year, over the years and cumulatively across the basin and impacts thereof.
4. **Green House Gas emissions**, project wise & cumulatively.
5. Cumulative impact of mining of various materials required for the projects (sand, boulders, coarse and fine granules, etc.)
6. Cumulative impact of blasting of tunnels on various aspects.
7. Cumulative impact of muck dumping into rivers (normal practice) and of muck dumping if done properly.
8. Impact of release of silt laden water into the river channel downstream from the dams, and how this gets accumulated, to be assessed singly and cumulatively.
9. Impact of release of silt free water into the river downstream from the power house and impact thereof on the geo morphology, erosion, stability of structures etc, singly and cumulatively.
10. Cumulative impact of all the project components (dam, tunnels, blasting, power house, muck dumping, mining, road building, township building, deforestation, transmission lines, etc) for a project and then adding for various projects.
11. Cumulative impact of deforestation due to various projects.

**Considering these issues, the Basin Study Report, as it stands now should be rejected & a fresh study, which includes multiple stakeholders should be initiated which will give us a clear idea of the possible impacts of the cascade of projects on the ecology and people in the Lohit river Basin.**

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**Considering these issues, the WAPCOS’s Lohit Basin Study Report should be rejected & a fresh study by an independent, credible agency should be initiated.**