21 Nov 2012

To,

1. Smt Jayanthi Natarajan, Union Minister of state of Environment and Forests (IC), New Delhi

2. Dr. Tishya Chatterjee, Secretary, Ministry of Environment and Forests, MoEF, New Delhi

3. Shri Ajay Tyagi, Joint Secretary, Ministry of Environment and Forests, MoEF, New Delhi

4. Chairman and members, The Expert Appraisal Committee (EAC) for River Valley and Hydropower projects, Ministry of Environment and Forests, Government of India, New Delhi

Subject: Suggestions for serious, urgent measures and in situ protection to mitigate impacts of dams on riverine fisheries and fish biodiversity, on the occasion of World Fisheries Day.

Respected Madam, Chairman and Members of EAC on RVP,

We are writing to you on the occasion of **the World Fisheries Day, Nov 21, 2012**.

As you are aware, impacts of dams on Riverine biodiversity, including fish biodiversity, have been devastating for Indian Rivers.[1] This has been stressed many times by fisher folk as well as studies by Central Inland Fisheries Research Institute, Central Marine Fisheries Research Institute, several universities, independent researchers, NGOs and even the last three Five Year Plans from Planning Commission of India. Dams have been singled out as the main reason behind fisheries collapse in major rivers like Ganga and its tributaries, Krishna, Mahanadi and Narmada, to name a few. Dams and related hydrological fluctuations have magnified the impacts of several other aspects detrimental to fisheries like pollution, sedimentation, wrong fishing practices and invasion by exotic introduced fish species.

In India, which is the second largest freshwater fish producer in the World, we do not even have a census of fisher folk depending on rivers[2]. A gross estimate suggests that more than 75% of our 14 million fisher folk depend on freshwater, that means **more than 10.86 million fisher folk depend on rivers, floodplains and estuaries for their subsistence and survival**. And the livelihoods of these communities is being destroyed because of the short-sighted decisions being taken while sanctioning dams, hydropower projects, diversions and the absolute absence of any credible appraisal, impact assessment, mitigation or in situ protection methods. Some very glaring examples include blockage of Hilsa migration due to Farakka barrage on Ganga, failure of Farakka fish lifts in aiding migration, collapse of carp fisheries in Ganga following increasing water abstraction from upstream diversions, complete collapse of estuarine fisheries in Krishna due to upstream abstraction leading to hyper saline conditions, collapse of Mahseer fisheries in Narmada in Madhya Pradesh following building of a series of mega dams including Narmada Sagar, Bargi, Tawa, and Sardar Sarovar Dams, alarming drops and near extinction of Hilsa fisheries in almost all estuaries and rivers like Ganga, Krishna, Godavari, Mahanadi, Cauvery and Narmada due to blockage caused by upstream dams.

We do not have an estimate of the livelihood and nutritional losses caused by this collapse. Even in terms of economic losses, the amount of losses would be gargantuan and this keeps compounding every year with increasing, non-estimated losses. However, such losses are always discounted without any cognizance in river, water and environment policies.

[1] http://sandrp.in/dams/Impacts_of_Dams_on_Riverine_Fisheries_in_India_ParineetaDandekar_Sept2012.pdf

Invaluable aquatic biodiversity is also facing severe threats due to dams and abstractions. Most mitigation measures like the fish farms, hatcheries and rare ladders do nothing to protect the very rich fish biodiversity in India. India is a mega-diverse country with respect to freshwater fish, with close to 1000 species and more being discovered each year. Dams are also having a tremendous negative impact on aquatic biodiversity like Gharials, Ganges river dolphins, numerous endemic frog species, water birds, related terrestrial biodiversity, etc. There has been a failure on follow-ups to commitments made on release and maintenance of near-natural flow regimes, or even minimum flows or e-flows.

Implementation of existing laws and frameworks, clearance conditions related to rivers is unmonitored and mostly non-existent. There is no specific body entrusted with the protection of aquatic biodiversity, no separate Ministry for fisheries, no law for protecting fish diversity (the Fisheries Act, 1897 deals only with edible species), no law for protecting river flows, no law for enabling fish migration, no law for compensating affected Fisherfolk, there no fish species in any of the lists under the National Wildlife act, to list a few. These are very serious gaps, with impacts on ecology as well as sociology. We request the MoEF to look into these overarching issues urgently.

In this scenario, proposals for more dams which will fragment rivers further and divert flows away from the river have to be looked at very carefully. Unfortunately, most of the decisions taken during the EAC meetings and the number of dams receiving environment clearance at various stages, are mostly without adequate attention to impact on fish and mitigation measures. This is very disturbing and needs immediate change. EAC discussions and decisions are based on EIAs submitted by the proponent and these are routinely of a poor quality. Most of the EIAs severely underestimate fish diversity, for example Environment Impact Assessment of 200 MW Gundia HEP done for KPCL which concludes that there are 'no rare or endemic species fish species in the river'. This is entirely wrong, and the region is one of the most important sites in India for protection of fish diversity as clarified by many studies in the region including one conducted by Indian Institute of Sciences, Bangalore. This is just indicative, there are scores of such examples which can be readily provided and are available online too.

The EAC needs to lay clear norms for EIAs about fish diversity in the region, dependant livelihoods, community conserved fish sanctuaries & impact of dams on all these, in situ mitigation measures, including eflows and only after that ex situ measures like hatcheries.

Unfortunately, an analysis of EAC decisions during the past three years[3] reveals:

1. The EAC has demanded for fish passes and fish ladders at the time of recommending environmental clearance for only six projects out of 157 projects considered by it for clearance at stage I or II. Even in the six cases, this important condition is not clearly or strongly worded.

2. The EAC has demanded for fish passes/fish ladders at the time of granting/reconsidering Term of References for only nine projects and even here, the wording has been ambiguous. For example, in case of 50 meters high Mago chu Dam in Tawang Basin in Arunachal Pradesh, the EAC says 'fish pass *may be* considered'. Or for 128 MW Jelam Tamak in Uttarakhand, it says fish pass '*may'* be provided.

3. For scores of dams, fish passes and ladders have not at all been recommended, though there is a strong reason to do so.

o For example, in case of 36 MW Chanju I project whose barrage is 16 metres high or 17 MW Chanju II HEP on Chanju Nallah in Himachal Pradesh, the EAC has not recommended a fish ladder. It has simply taken the word of the developer that there are no fish in Chanju Nallah. Actually Chanju

[3] Analysis of decisions from 34th EAC Meeting: Jan 2010 to 61st EAC Meeting: Oct 2012

Nallah and Siul Nalla where the projects will come up are on the Negative List provided by the Himachal Pradesh Fisheries Department, recommended for In situ protection of fish.[4] The EAC must immediately reconsider their decisions on Chanju I and II projects, reject the projects and recommend strong punitive measures against the developer and EIA consultant for providing wrong information, as per the provisions in EIA notification. EAC also needs to take steps to ensure that it does not get misled like this in future and take wrong decisions.

- In case of 104 MW Lara Sumta HEP or 130 MW Sumte Kothong HEP in Lahaul Spiti, Himachal Pradesh, where the height of the barrages is 22 meters, the EAC has not recommended Fish Ladders, although the region is famed for its native trout fish.
- For many dams in Eastern Himalayan Biodiversity hotspot, no ladders or passes have been recommended.
- 200 MW Gundia Dam to come up on Gundia River in Kumaradhara Netravathi Basin, where just in the past six months six new fish species were discovered[5], no fisheries management plan is in place while recommending a very erroneous environmental clearance, going against the recommendation of the Western Ghats Ecology Panel appointed by the MoEF. This region is especially important for in situ protection of fish biodiversity and is a freshwater fish biodiversity hotspot in the World Heritage Site of Western Ghats.
- In case of Renuka dam on Giri River in Himachal Pradesh, the Central Empowered Committee of the Supreme Court and the Supreme Court itself had directed that fish ladder be constructed, but the developer, EIA consultant, the EAC and the MoEF all ignored that statutory direction.
- The above list is only an indicative list, fish ladders/ passes are not recommended nor their feasibility assessed for most dams at the time of granting TORs or Environmental Clearances (EC).

4. While some dams are recommended fish ladders or passes, some are not without assigning any reasons for such inconsistencies. Decisions of the EAC seem totally inconsistent, unscientific and ad hoc.

- For example, in case of 50 meters high Mago Chu in Arunchal Pradesh, EAC has said fish pass may be considered, but for 42 meters high Dinchang Dam (360 MW revised to 260 MW as per Bichom Basin Study), the EAC explicitly said: "The proposal for providing fish ladder in a 42 m high dam was not appreciated by the EAC as fish ladder in high dams is failure everywhere." However, for the same dam, while reconsidering TOR for revised capacity from 90 MW to 360 MW, the EAC says "Committee felt that the issue cannot be left loose ended for a study. The Proponent needs to agree to provide fish passage for which the Proponent agreed."

Firstly, EAC needs to ensure that decisions made one stage are not reversed at another without assigning adequate reasons. Such lack of consistency in EAC decisions for same projects at different stages have been seen in other cases too like the Seli hydro project on Chenab River in Himachal Pradesh. Secondly, the EAC needs to define fish pass and fish ladder clearly as in normal parlance, the phrases are interchangeable and there are numerous designs for fish passes and ladders. In many countries, including Bhutan, fish ladders are built and are functioning effectively for high Dams. In Bhutan, for the 60 MW Kurichhu Dam built by India NHPC, a functioning fish ladder for Golden Mahseer Migration has been provided and is reported to be working well.

- While the EAC has recommended fish ladder for P.V. Narasimha Rao Kanthanapally Sujala Sravanthi Irrigation Project in Warangal District of Andhra Pradesh, it has not done so for many irrigation projects with comparatively low dams on biodiversity rich rivers like Kanhan, near Pench National Park in Maharashtra or Kundalia Major Irrigation Project on River Kali Sindh in Madhya Pradesh, a tributary of river Chambal, or the Indira Gandhi Sagar Project on Wainganga River, which

[4] http://hpfisheries.nic.in/pdf/Negative_list_rivers_etc.pdf
[5] http://www.deccanherald.com/content/264870/researchers-stumble-species-fish.html

is destroying the livelihoods of 15000 fisherfolk only in the upstream, while the downstream impacts are not even estimated. As per one estimate, more than 4 lakh people depend on Wainganga River for fisheries alone.

We urge the EAC to bring in consistency in recommending fish passes and ladders, based on some unbiased, scientific studies and local participation.

5. Hatcheries and Fish Farms are increasingly being recommended by EAC when impacts of these on riverine biodiversity are entirely unstudied and unmonitored by MoEF. When effectiveness of these measures is not known, millions of rupees are allocated for the purpose without an assessment of what happens to those millions.

The mainstay of all Fisheries Management Plans for hydroelectric projects seems to be **hatcheries, reservoir (where there are reservoirs) fisheries and fish farms**. However, there has been no study commissioned by the MoEF or recommended by the EAC or by any credible agency to study the impacts of these measures on riverine fisheries, livelihoods of local fisherfolk which are destroyed by the projects. In this process, state fisheries departments are receiving huge sums of money from the private developers as compensation and for developing hatcheries and fish farms. This seems to be one of the main reasons for easily-acquired No-Objection-Certificates from State Fisheries Departments.

In Himachal Pradesh alone, the Department of Fisheries charges "compensation @ Rs. 0.50 lacs per MW power capacity and Rs. 0.50 lacs per km from tail race to weir of the project in case of macro projects being envisaged on the run of the river development." Bajoli Holi Project envisages paying a compensation of Rs. 97.75 lakhs to the fisheries Department, in addition of development charges for farms and hatcheries. Luhri Environmental Management Plan has an outlay of Rs. 346.57 Lakhs for fisheries management plan, to be paid to fisheries department. No wonder then that the Fisheries Department is providing NOCs to most hydel projects, including those coming up in Negative List of Streams for in situ conservation. However, there is no information as to what happens to these millions of public money. The affected people are not even assessed for the impact of destruction of fisheries.

What studies are conducted to ascertain the impact of these farms of riverine fish diversity? The EAC is fast in rubbishing fish ladders for high dams, though the same are being used on many dams around the world after some serious research.

It has been proved by studies in different parts of the world over that hatcheries help only a few targeted species (often exotic species) and not the biodiversity of the river. On the other hand, fish from hatcheries may actually be detrimental to wild riverine fish.[6] In India too, hatcheries are breeding bigger species, commercial varieties and exotics like exotic carps in many hatcheries and Rainbow Trouts in most of the Himachal Hatcheries. **They do not help fish biodiversity and natural population restoration, nor are they targeted to protect indigenous species**. They have impact on fish diseases, limit the gene pool, and affect invaluable biodiversity. Measures like Hatcheries, fish farms, reservoir fisheries also change the ownership of fisheries from a common pool resource to a controlled resource, severely affecting security of the people who depend on riverine fisheries for nutrition and livelihoods.

In case hatcheries and fish farms are unavoidable and these and reservoir fisheries are the only option, they can be set up on the lines of community managed reservoir fisheries like on Dimbhe Dam near Pune organised by the efforts of Shashwat.[7] Why is the EAC not recommending other

[6] http://www.nwfsc.noaa.gov/resources/salmonhatchery/risks.cfm, http://phys.org/news/2012-05-hatchery-fish.html

[7] http://articles.timesofindia.indiatimes.com/2012-07-10/pune/32617839_1_tribal-farmers-catchment-area-villages

options like innovative and well researched fish ways, fish passages and ladders and actual in situ conservation of fish by protected rivers? River Tirthan in Himachal Pradesh is possibly the only example in India of a River protected for its rich fisheries. We urgently need to replicate such initiatives for other biodiversity rich rivers and stretches in all states and all kinds of aquatic ecosystems.

6. The EAC should look at in situ Conservation of fish and aquatic biodiversity much more seriously. For this, a number things need to be changed like:

1. **Environmental flows:** The current norm of recommending 20% of average lean season flow in a 90% year, 30% of average monsoon flow and 20-30% of flow for months in transition is too little, ad-hoc, unscientific and not river and species specific. For many fish species which need flooding as a cue for spawning and upstream migration, 30% of monsoon flows will not help. We urge the EAC to recommend project specific, river specific eflows studies, based on the ecology and sociology of the river, to be conducted by independent credible organisation, with local participation. These flows will change from river to river and drastically from Himalayan to Peninsular Rivers. The EAC should explore state of art methodologies like the Building Block Methodology instead of ad hoc, unscientific 'rule of thumb' methods currently adopted.

In the absence of adequate and continuous e-flows, fish passes and ladders will have no meaning. The EAC to make it mandatory for all the projects to make public give their water release schedule from 30th September to 30th June each year and that should be strictly followed. It will ensure substantial and timely flow in river and it will be useful for the downstream fisherman to plan their activities of fishing and river bed farming.

It has been proved that fisheries collapse in most of the rivers have occurred due to absence of freshwater flows and spawning cues. Environmental flow allocation to estuaries is extremely crucial. Maintenance of artificial floods has been practiced in many countries in Africa which has led to improvements in fisheries and have regularized high flow volumes well. These techniques need to be added to year-round regular maintenance of e-flows.

2. **Release of environmental flows through fish passes/ ladders and not turbines:** THE EAC very urgently needs to link eflows with fish passes. While some well researched innovative designs of fish ladders/ passes for Indian conditions and biota are available or adopted from other tropical countries, all the eflow releases should take place through these fish ways and not additional, smaller turbines, as is being done now. It needs to be realised that fish cannot use turbines for migration. Where fish pass or ladder is proved to be not feasible, for assurance of continuous flow, an ungated opening in the dam just below the MDDL (minimum Draw Down Level) adequate to assure lean season eflows should be mandated.

3. **Distance between Dams:** The current onslaught of cascade dams on biodiversity rich rivers like Alaknanda, Bhagirathi, Chenab, Sutlej, Siang, Dibang, Subansiri, Teesta, Tawang, Kameng, Lohit, Netrawathi, Narmada, etc., will be disastrous to fish biodiversity. The current norm of EAC (though the EAC does not accept it as a norm, this is what it currently recommends) of a mere 1 kilometre of river between two hydropower dams will have very serious impacts on fish biodiversity and fisheries. This distance should be based on study of fish and riverine biodiversity for each river by an independent credible agency (not EIA consultants paid by the project developers without ANY credible accountability mechanism including the current mechanism under Quality Council of India) which should be got done before more than one projects start getting sanctioned on any river. In any case, the distance should not be less than 5 km, which has been the recommendation of the Avai Shukla Committee appointed by the Himachal High Court and the reported recommendation

of the PM appointed B K Chaturvedi committee. The EAC itself has stated in its 56th Meeting that minimum 50% of the river should be left free flowing, but it is refusing to follow its norm in any river.

We urge the MoEF and EAC to conduct studies about optimum distance between two dams, based on the carrying capacity, ecology and sociology of the basin. This study should be done prior to recommending environmental clearances and not delinked from ECs. The EAC should also follow its recommendation of leaving at least 50% of the river undammed and unaffected by tunnels.

4. Monitoring and compliance: Monitoring and compliance of actual eflows releases, functioning of fish ladders, impacts of hatcheries and fish farms on diversity and local livelihoods needs to conducted by a legally empowered project specific team with 50% participation from local communities and civil society groups.

5. Exclusion of dams from EIA notification: The EIA notification of Sept 2006 that is currently being followed has excluded large dams for drinking and industrial water supply, hydroelectric projects below 25 MW and also flood control measures like embankments from its purview. The assumption that these are environmentally benign measures with low environmental impacts (including on fisheries) is clearly wrong. Embankments on Brahmaputra have resulted in declined carp fisheries while small hydro projects in Western Ghats of Karnataka are seriously damaging very rich fish biodiversity and community fish sanctuaries.

The MoEF urgently needs to change this to include all large dams (as per CWC/ ICOLD/ WCD definition), all hydro projects above 1 MW and all embankment projects for Environment clearance requirements. This will also help protect fisheries and riverine biodiversity.

The River Regulation Zone (RRZ) Notification needs to be urgently promulgated to protect riparian habitats along rivers and dams which play a crucial role in fish breeding and populations.

Many fish are apex feeders in most riverine systems and fish diversity and abundance, along with vital population processes (migration, recruitment, spawning etc.) indicate the overall health of the river. We hope that freshwater fisheries, which are an important component of our rich freshwater biodiversity and a source of subsistence for millions of Indians, are given their due by the MoEF and the EAC. Aquatic vegetation is part of the living habitat of the fish and also needs protection.

This is even more relevant and urgent in the context of climate change which is leading to major hydrological changes and affecting aquatic habitats. Dams are compounding habitat loss leaving no adaptive options for people or biodiversity alike.

We hope that the MoEF and EAC together look at in situ conservation of fish urgently and seriously and helps protect rivers in the process.

A number of other suggestions about specific decisions, specific projects and specific measures are made in this letter. We request you to pay urgent attention to these, on the occasion of World Fisheries Day and beyond in the times to follow.

Looking forward to your responses on the points raised above,

Endorsed by:

1. **Dr. A.J.T Johnsingh**, Eminent Wild Life Biologist, Member-National Board for Wild Life Standing Committee and Member, National Tiger Conservation Authority, Kerala, ajt.johnsingh@gmail.com
2. **Dr. Sunil K. Choudhary**, Principal Coordinator, Vikramshila Biodiversity Research & Education Center, University Dept. of Botany, T.M.Bhagalpur University, Bhagalpur, sunil_vikramshila@yahoo.co.in

3. **Dr C.P. Shaji**, Fisheries Scientist, Kerala, shajibarb@gmail.com
4. **Dr. R. Rajkumar**, Associate Professor, Research and PG Dept. of Zoology,Govt. Victoria College, Palakkad, Kerala, drrajfilmmaker@gmail.com
5. **Dr Prakash Nautiyal**, Aquatic Biodiversity Unit, H N B Garhwal University, Uttarakhand, lotic.biodiversity@gmail.com
6. **Dr. Nilesh Heda**, Fisheries Scientist, Karanja Lad, Washim, Maharashtra, nilheda@gmail.com
7. **Dr. Shrinivas Badiger**, Water, Land and Livelihoods Expert, Karnataka, sbadiger@atree.org
8. **Dr. Latha Anantha**, River Research Centre, Kerala, rrckerala@gmail.com
9. **Dr. Biju Kumar**, Associate Professor and Head, Department of Aquatic Biology and Fisheries University of Kerala, Thiruvananthapuram , Kerala, dr bijupuzhayoram@gmail.com
10. **Dr. K.H. Amitha Bachan** , Research Director, Western Ghats Hornbill Foundation, Kerala, amithab@poetic.com
11. **Nachiket Kelkar**, Scientist, Nature Conservation Foundation, Karnataka, rainmakernsk@gmail.com
12. **Panduranga Hegde**, Shrishti, Karnataka, panduhegde@gmail.com
13. **Nisarg Prakash**, Otter Expert, Nityata Foundation, Karnataka, nisargprakash@gmail.com
14. **Jiten Umnam**, Citizens Concern for Dams and Development, Manipur , jitnyumnam@yahoo.co.in
15. Committee on the Protection of Natural Resources in Manipur
16. Centre for Research and Advocacy Manipur
17. **Ravindranath**, River Basin Friends, Dhemaji, Assam, assamravi@yahoo.co.in
18. **Shankar Sharma**, Power Policy Analyst, Karnataka, Shankar.sharma2005@gmail.com
19. **Samir Mehta**, International Rivers, Mumbai, samir@internationalrivers.org
20. **Manish Rajankar**, Bhandara Nisarga Va Sanskruti Abhyas Mandal, Bhandara, manishrajankar@gmail.com
21. **Ranjan Panda**, Water Initiatives Odisha, Sambalpur ranjanpanda@gmail.com
22. **Himanshu Thakkar** (09968242798, ht.sandrp@gmail.com), **Parineeta Dandekar** (9860030742, parineeta.dandekar@gmail.com), South Asia Network on Dams, Rivers and People, Delhi (www.sandrp.in)