

Yettinahole Diversion: An imprudent, Rs. 100 Billion proposition

Karnataka has been mulling over diverting waters of the west flowing rivers to the east for many years. Netravathi-Hemavathy Link was proposed by the National Water Development Agency (NWDA) as a part of peninsular component of the River linking project. In the meantime, Karnataka appointed a committee under Dr. G. S. Paramshivaiah which worked on a plan to divert waters from west-flowing rivers including Netravathi to 7 districts of Bayaleseeme region including Kolar, Bangalore, Tumkur, Ramanagara, Chikmagalore, Chikkaballapur, etc.

But currently, the Karnataka Government is seriously considering Yettinahole Diversion Project which

Purpose of this scheme is stated as drinking water supply to Kolar and Chikkaballapur Districts. However, analysis of the Project Report indicates that drinking water to be supplied to Kolar and Chikkaballapur will be a bare 2.81 TMC or 11.7% of the 24.01 TMC diverted. If water is supplied to Bangalore (urban) as is said in the Budget, but not the Project Report, then water supplied to Kolar and Chikkaballapur will be even less, possibly nil. Kolar and Chikkaballapur have better options but they won't even be considered if this project goes ahead.

plans to divert head waters of the Gundia River (a tributary of the Kumardhara, which is a tributary of the Netravathi) in the west and transfer this water to the other end of the state, in the east. It has been reported that tenders for this project have been floated already. Its Project Report (June 2012) is titled as 'Scheme for diversion of flood water from Sakleshpura (West) to Kolar/ Chikkaballapra Districts (East)'.

SANDRP analyzed the Yettinahole Project Report (YPR) which was obtained under RTI by Mr. Kishore Kumar Hongadhalla, who had specifically asked for a 'Detailed' Project Report. The total cost of the project as per the YPR is 8323 Crores. But the estimate does not include many costs like Rehabilitation and Resettlement (R & R), complete land acquisition, construction of reservoirs on Palar Basin as mentioned in the YPR, pipeline to 337 tanks, Forest NPV, etc. If these are included, cost of the project will certainly go beyond Rs 10000 crores, or Rs 100 billion.

Analysis of the Project Report and site visit to Yettinahole and surrounding catchments indicate that this project is economically,

socially and technically unviable and will have a massive impact on the ecology of the Western Ghats and eastern plains. The analysis also assesses the claim of providing drinking water to Kolar and Chikkaballapur: whether it is viable, desirable and optimal option.

I. The Project The project involves construction of 8 dams in 2 phases at the head waters of Gundia River catchment in the West flowing Netravathi River Basin, the lifeline of Mangalore and Dakshin Kannada districts. The YPR insists on calling these as weirs, but the drawings indicate the height these dams as 15 meters from deepest foundation, making them large dams, as per the definition of International Commission on Large Dams {ICOLD}.

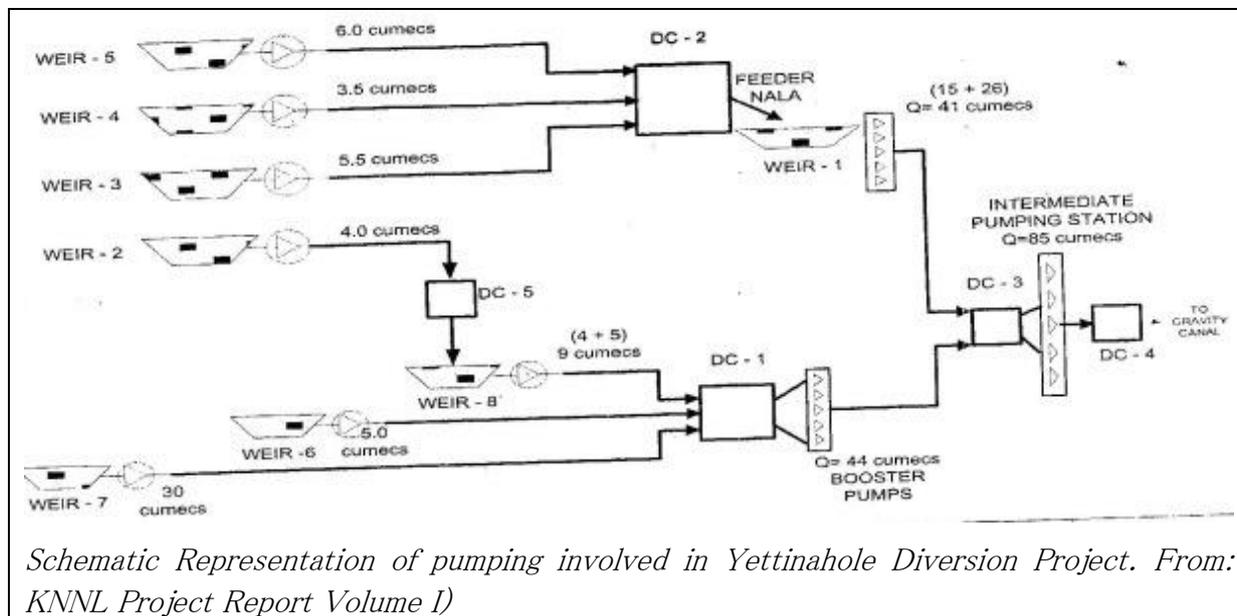
Dams and rising mains in Western Ghats: 2 dams are planned across Yettinahole stream, 2 on its tributaries, 2 across Kadumanehole stream, 1 across Kerihole stream and 1 across Hongadhalla stream. All these streams are rivulets which join at various points to make river Gundia. Rising mains (large pipelines that transport water under pressure) from these projects will pump water into 3 delivery chambers. From the delivery chambers, water will be lifted to an intermediate pumping station at Doddanagara in Sakaleshpur. From Doddanagara, water will be lifted again and conveyed to Delivery chamber 4 located near Harvanahalli in Sakaleshpura.

233 kms long Gravity canal From Harvanahalli, water will flow through a gravity canal of 233 kms (Proponent says 250 kms in MoEF Meeting) in length to Tumkur.

Devaranya Durga Reservoir From Tumkur, again the water will be lifted through a rising main and will culminate into a reservoir to be built at Devaranya Durga. This reservoir will have a height of 68 m and gross storage capacity of 11 TMC (Thousand Million Cubic Ft, a unit for large quantity of water

typically used in south India. 1 TMC = 28.32 Million Cubic Meters (MCM)). It will submerge approximately 1200 ha, half of it forests.

When this project was discussed in the Expert Appraisal Committee meeting of the Ministry of environment and Forests, the proponents have claimed that Devaranyadurga Reservoir will submerge 1200 ha of land, of which 50% will be forest land and will also submerge at least 2 villages.



From here, two rising mains of 80 kms and 55 kms will again lift and convey water to Chikkaballapura and Kolar respectively. In Chikkaballapura and Kolar, the rising main will feed various streams and rivers and will have dedicated pipelines to feed Minor Irrigation (MI) and Zilla Parishad (ZP) tanks. Scheme envisages feeding 198 tanks in Chikkaballapur and 139 tanks in Kolar District.

In Karnataka Budget, Feb 2012, Rs 200 Crores have been allocated for making DPR & initial works while Rs 2670 Crores have been sanctioned and Rs 850 Crores allocated in 2013-14 for works upto Harvanahalli in Sakaleshpura. All these allocations have been made without a Detailed Project Report, cost benefit assessment, options assessment, environmental and social appraisal, or any statutory clearances.

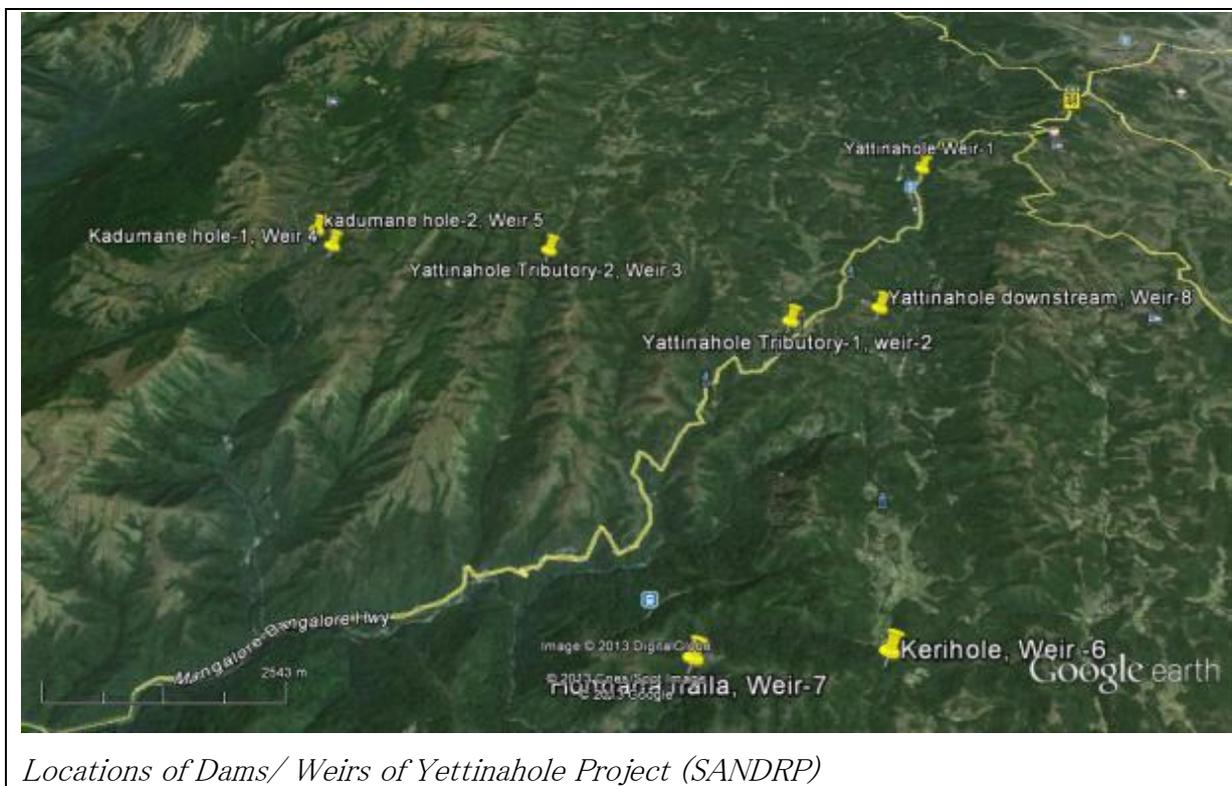
The scheme envisages providing 14 TMC for Hassan, Chikkamagalore, Tumkur and Bangalore rural and 10 TMC for Kolar and Chikkaballapur, through the dam at Devaranyadurga. So, the claims that Kolar and Chikkaballapur will get 24 TMC water is false. **The project report is titled 'Scheme of diversion of floodwaters to Chikkaballapur and Kolar' but these districts seem to be getting less than 50% of the diverted water. As we see in later sections, of this 10 TMC barely 2.81 TMC is earmarked for drinking water supply.**

New Reservoirs planned: In addition to the 8 dams in Gundia basin and Devranya Durga reservoir, following reservoirs are part of the scheme.

Chikkaballapur District A new reservoir across Kushavathy River at Gudibande and one at Timassandra across Palar River.

Kolar District Bethmangala Tank to be used as an important reservoir; one at Tanadihalli on Palar River North to store 2.20 TMC water. Electricity needed: As per the YPR, the scheme will require massive 370 MW power.

Volume of water to be diverted 24.01 TMC water is proposed to be diverted between June-November from a catchment area of 89.66 sq km (8966 ha). It has to be noted that 24.01 TMC water is available at 50% dependability. So, in 50% years, full quantity of 24.01 TMC volume would not be available for diversion. The structures and conveyance system has also been designed at 50% dependability.



Locations of Dams/ Weirs of Yettinahole Project (SANDRP)

This may imply one or more of several things:

- **The scheme can work beyond June-November**
- **The scheme can divert more than 24 TMC waters from Yettinahole**
- **The scheme can be used later for diverting waters of other rivers.**

This further warrants a serious look at the entire project.

II. Environmental Impact of the Project on Western Ghats and other regions: Impact on Forest Land and Wildlife

No provision has been made for environmental flows. This will be extremely damaging for the downstream ecology, wildlife and forests. This will be clearly unacceptable. The scheme may look unviable if e-flows are released, as they must be, from the dams for the downstream river.

The exact extent of revenue, private, agriculture and forest land required for the scheme is not known from the YPR. The report (Vol II, Estimates) mentions a head 'clearing of thick forest by burning' under costs for laying rising mains from dams to pumping stations. According to these estimates, 107.27 ha of thick forests will have to be cut or burnt for the rising mains alone.

The forest land involved in submergence of dams, approach roads, workers colonies, muck dumping sites, electrical substations, mining of materials for the project, destruction due to blasting, etc. will be additional. The

project report does not provide any of these details.

Most of the forests in the vicinity of Yettinahole, Kadumanehole, Kerihole & Hongadhalla are not only reserved forests, but important wildlife corridors. When IISc studied this region it recorded 119 trees species, 63 shrubs and climbers, 57 herbs and 54 pteridophytes, 44 species of butterflies, 4 dragon

and damsel flies, 23 species of amphibians including the threatened Gundi Indian Frog, 32 reptiles, 91 birds and 22 mammals including Tiger, Lion Tailed Macaque, Elephant, Slender Loris & Gaur.

The region is witnessing rising **man-animal conflicts** due to destruction and degradation of habitats. During 2002-2012-13, 34 people have died and 17 elephants have been electrocuted in Sakaleshwar

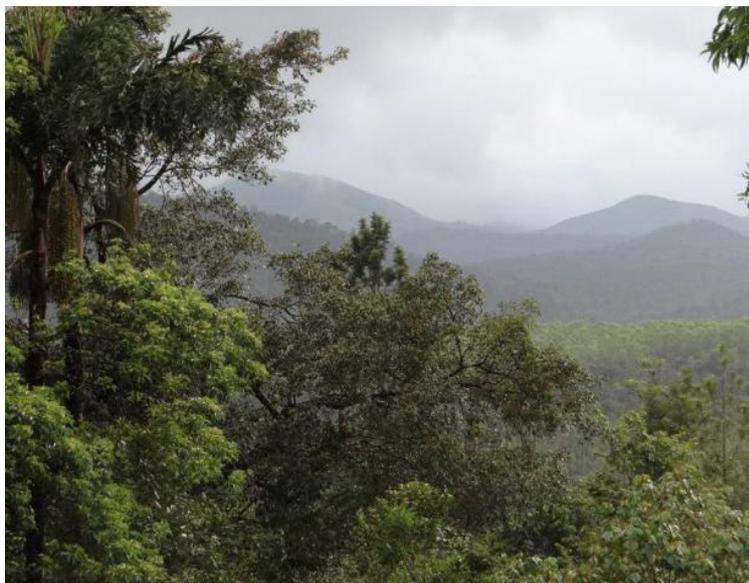


Elephant dung at a KPCL survey in Hongadhalla region, to be affected by Yattinahole Diversion Project. Photo: IISc

Taluk alone (<http://www.thehindu.com/news/national/karnataka/elephant-encounter-is-an-everyday-affair-for-them/article4874172.ece>).

The Karnataka Elephant Task Force has acknowledged the impact of mini hydel projects in Sakaleshpur on Elephant corridors and has given strong recommendations about reviewing clearance and cancelling projects which affect elephant distribution areas negative and do not comply with existing laws.

Dams, roads, blasting, muck disposal, workers colonies, sub stations, increased traffic in this region will have a pronounced impact on the wildlife, including the elephants. Any more stress on these regions will precipitate in furthering of conflicts and disturbance.



Yettinahole Catchment and surrounding forests Photo: SANDRP

Environmental Flows As per the working tables, all inflow from the headwaters will be diverted for the most of June, parts of July and August and all of September, October and November. The streams will be completely dry for most days during this period. (YPR Vol. I, Page A 21) No provision has been made for environmental flows. This will be extremely damaging for the downstream ecology, wildlife and forests. This will be clearly unacceptable. **The scheme may look unviable if eflows are released, as they must be, from the dams for the downstream river.**

Impact on fish assemblages and fish sanctuaries Kumaradhara and Netravathi are home to some rare community conserved fish sanctuaries. Fish sanctuaries exist at Kukke Subramanya, Nakur Gaya and Yenekal, all of which are downstream from the proposed diversion. The fish assemblages, their feeding and breeding patterns are hugely affected by flow. Any drastic changes in flow regime will affect these species.

Gundi River itself has several rare and endangered fish species. 3 new fish species have been discovered and 1 rediscovered in Kumardhara river basin in 2012-13.

Blasting using dynamite The YPR and estimates state that hard rock will need to be blasted extensively with dynamite. Such blasting will have severe negative impact on the wildlife of the region. Blasting also has documented harmful effects on groundwater aquifers and can affect the existing water sources and water holes of the wildlife.

Muck generation and disposal As per the YPR, muck generated for laying the rising mains alone will be to over 1.3 MCM. All of this muck will be generated close to the rivers, in forest areas. Dumping of this muck will have a huge negative impact on water quality, forests and wildlife. Uttarakhand disaster in June 2013 highlighted how muck is routinely disposed into rivers and the havoc this causes in the downstream. **Additional muck** will be generated during construction of dam, approach road, colonies, substations, etc.

Approach roads, workers colonies All the dams/ dams, rising mains, electric substations will require approach roads which will pass through forests, further impacting forests and wildlife. Workers colonies and waste disposal will again have additional impacts on the region.

Diverting entire rivers and not just floodwaters The scheme claims that it is diverting only the flood



waters of these rivers. However, the yield of all the rivers at 50% dependability between June-November is 28.94 TMC, out of which 24.01 TMC (83%) will be diverted. This leaves just 4.93 TMC, out of which evaporation losses are also to be accounted. This is total diversion of the rivers and not just diversion of 'flood waters'. Even when rainfall is low, the scheme will divert all available water till it gets its share of 24.01 TMC, which will then dry the rivers completely in the downstream.

Congregation of the endangered Mahseer fish at Yenekal Fish Sanctuary, Kumaradhara River downstream proposed Yettinahole diversion. Photo: SANDRP

These are monsoon-fed rivers. Only source of water for these rivers is the monsoon rain, which also replenishes groundwater, which constitutes the base flow in non-monsoon months. This diversion in monsoon months will have a huge impact on water availability in non-monsoon months also in these rivers and which in turn will have further impact on the biodiversity and livelihoods.

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III. Supposed Beneficiaries: Contradictions between Budget and Project Report As stated (verbatim) in the YPR, following are the beneficiaries of the project (YPR Vol I: Sec 4.7, P 52)

- Selected parts in Hassan District
- Selected towns in Chikmagalur, Chitradurga by feeding Vedavathi river
- Tumkur, Madhugiri, Pavagada and Koratagere Taluk
- Chamrajsagar reservoir

- **Water to Devanhalli Industrial Area**
- **Augmentation of Hesarghatta tank**
- **Water to Chikkaballapur and Kolar District**

In addition, water will be used to rejuvenate Rivers like Arkavathy (Cauvery Basin), Palar, (Independent basin) Jayamangli, Kushavathy, Uttara and Dakshin Pinakini, Chitravathi and Papagni rivers (Pennar Basin) (YPR Vol I: Sec 4.9, P 52) The YPR makes no mention of supplying water to Bangalore urban area or BBMP (Bruhat Bengaluru Mahanagara Palike). However, the Karnataka Budget 2012-14 specifically mentions providing water to these areas. How much water will this be? What are the options of water supply to Bangalore? If water is supplied to voracious Bangalore and Devanhalli Industrial area, will there actually be water for Kolar, Chikkaballapur and other drought affected areas?

River Rejuvenation Long distance transfer of water involving huge ecological, social and financial costs seems to be a poor way of rejuvenating rivers. Experts say that rejuvenating rivers like Arkavathy can be more optimally achieved with rainwater harvesting, demand side management, pollution control and releasing treated water in rivers like Arkavathy and Vrishabhavati, not through interbasin transfers.

Priority to Drinking water for Kolar and Chikkaballapur? Of the 10 TMC to be provided to Kolar and Chikkaballapur, the YPR mentions that drinking water needs of Kolar and Chikkaballapur Districts are 6 TMC. Rest of the 4 TMC will be used to fill up 337 MI and ZP Tanks in the districts.

The YPR proposes to fill these tanks at 60% live storage capacity. According to Table 2 and 3 in YPR Vol 1, P 7, this proposed 60% filling requires 4.08 TMC water in Chikkaballapur & 3.11 TMC in Kolar.



River Gundia, formed by Yettinahole and other streams which are to be diverted by the Project Photo: SANDRP

So together, as per the YPR, the proposed filling of MI tanks needs 7.19 TMC water. **This leaves bare 2.81 TMC water for drinking purposes of these districts!** If out of 24.01 TMC transferred, only 2.81 TMC will be supplied for drinking water to Kolar and Chikkaballapur, this is clearly not a drinking water supply project for these districts, as claimed.

So non-serious and undecided the YPR is about supplying drinking water that it says, "...alternatively if water is to be used fully for drinking, then it will require 4 new storage tanks". The YPR does not conclude whether these tanks will be built.

IV. Escaping Environmental Clearance by false claims

This scheme will:

- Destroy hundreds of hectares of pristine biodiversity rich and unexplored forests, wildlife habitats, habitats of critically endangered species, reserved and protected forests in the Western Ghats
- Affect downstream flows and riverine ecology of the Gundia, Kumaradhara & Netravathi Rivers
- Its Devaranyadurga reservoir will submerge 1200 ha, 50% of it forest land and 2 villages
- Main gravity canal which will be 250 kms long and 16 m wide (as stated in EAC meeting by proponent) will require a minimum of 400 ha
- It involves Interbasin water transfer, which is not

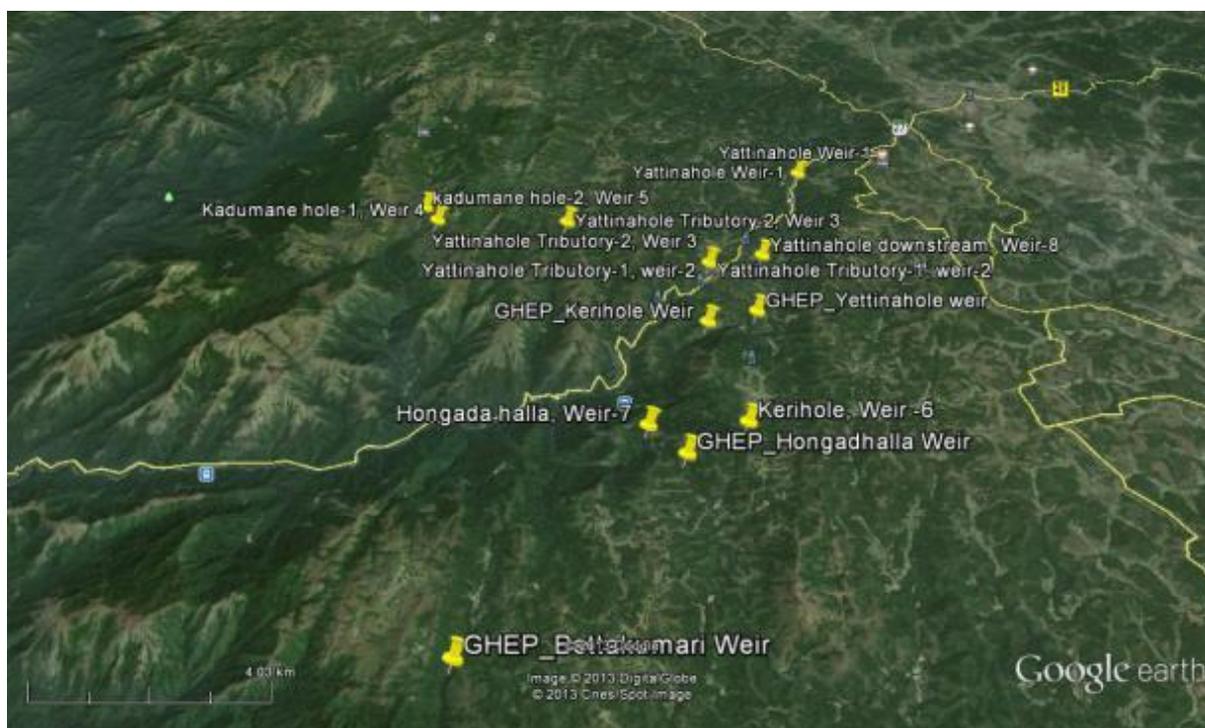
A joint letter has been sent by over 14 organisations and individuals across Karnataka, urging the MoEF to appraise this project under EIA notification. Signatories include former Forest Advisory Committee Member Dr. Ullas Karanth, Praveen Bhargav from Wildlife First, institutes like IISc, amongst many others.

prudent or viable as per the Western Ghats Expert Ecology Panel Report

- Clearly, at the least, the scheme requires detailed scrutiny for its impacts by undergoing participatory environment and social impact assessment and undergoing a thorough Environmental Appraisal.

The scheme has escaped this by wrongly claiming that it is a purely drinking water supply scheme. The proposal was considered by the Expert Appraisal Committee of the MoEF in its 63rd meeting in Oct 2012. In the meeting, the EAC noted that “there appears to be some environmental and R and R issues which should be addressed” but recorded its inability to consider this project as drinking water projects do not fall in the purview of EIA Notification 2006. The minutes note that: “*The project neither proposes any hydro-electric power generation component nor comprises of any irrigation component and thus has no command area.*” However, this is a wrong claim for the following reasons, among others:

A. Irrigation Component The EAC says that there is no irrigation component. However, the command areas of 337 minor irrigation tanks in Kolar and Chikkaballapur, as mentioned in the YPR (Vol I, Annex 3) come to 29,182 ha, all of which will benefit from the project. This is higher than command area of 10,000 ha stipulated in EIA notification; hence the project comes under the purview of EIA Notification 2006 and will have to be considered for Environmental Clearance by Expert Appraisal Committee of the MoEF under EIA notification 2006.



Locations of weirs and dams of Gundia Hydel Project (GHEP) and Yettinahole Projects (SANDRP)

It is clear that the EAC’s decision that the project does not fall under the purview of EIA notification is incorrect, it is based on wrong claims & inadequate appraisal. It is also unacceptable to exclude any large dam or project which has such significant impact on rivers & ecology from the purview of EIA notification & the notification should be amended.

B. Hydropower Generation The project claims that it can generate 125-150 MW of power through gravity canals. Location details are mentioned in the YPR (P 59, Vol I). As the total capacity is higher than 25 MW, the project comes under the purview of EIA Notification 2006 and will have to consider for Environmental Clearance by the Expert Appraisal Committee of the MoEF.

It is clear that the EAC’s decision that the project does not fall under the purview of EIA

notification is incorrect. Furthermore, it is unacceptable to exclude any large dam or project which has such significant impact on land and ecology from the purview of EIA notification and EIA notification needs urgent amendment.¹

V. Yettinahole & Gundia HEP overlap While the Karnataka Neeravari Nigam Limited is making Project Reports, DPRs and has earmarked huge budget in 2013-14, Gundia HEP (Phase I & II: 200 MW each) has been planned on the same catchments and same rivers by Karnataka Power Corp Ltd (KPCL). Gundia HEP proposes to divert flows from Yettinahole, Kerihole, Hongadhalla and Kadumanehole (Phase II) through maze of tunnels to generate 200 MW power in phase I and 200 MW in Phase II. KPCL has completed an Environment Impact Assessment for the project (which is of a poor quality). KPCL has also made presentations to the Western Ghats Expert Ecology Panel about the project.

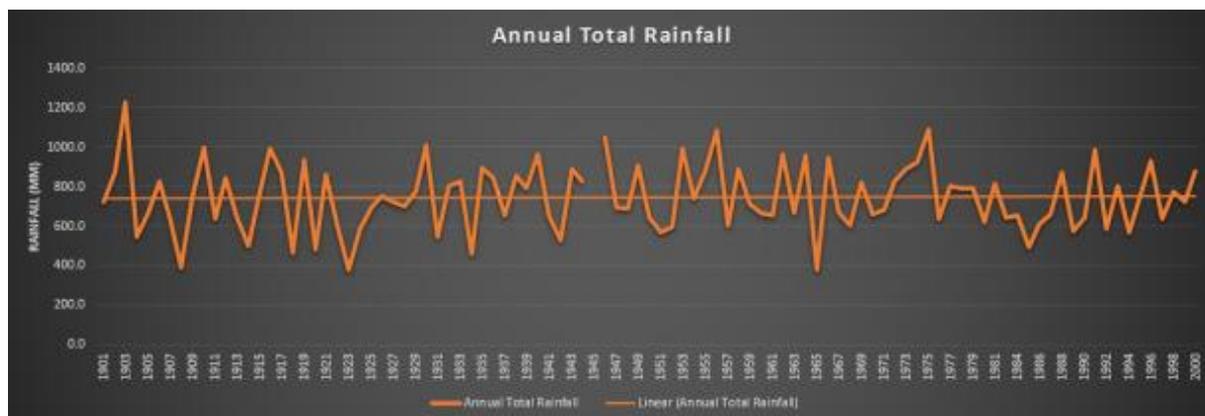
Is diverting water from west flowing rivers, at a huge social, ecological and economical costs the only option to provide drinking water to Kolar and Chikkaballapur regions? Is there no other optimal solution? Did the Karnataka government undertake an options assessment study to arrive at such a conclusion?

Power generation is based on water yield from the catchment, which will be intercepted by Yettinahole Diversion Project. In fact, dams of Gundia HEP and Yettinahole HEP are placed very close to each other. Both the projects, by the Karnataka Government are working in isolation and at cross purposes as if the other project does not exist.

Shockingly, both projects have also been considered within three months by the EAC of the MoEF for appraisal. The Expert Appraisal Committee of the MoEF in its 59th Meeting in July 2012 considered Gundia HEP and in its

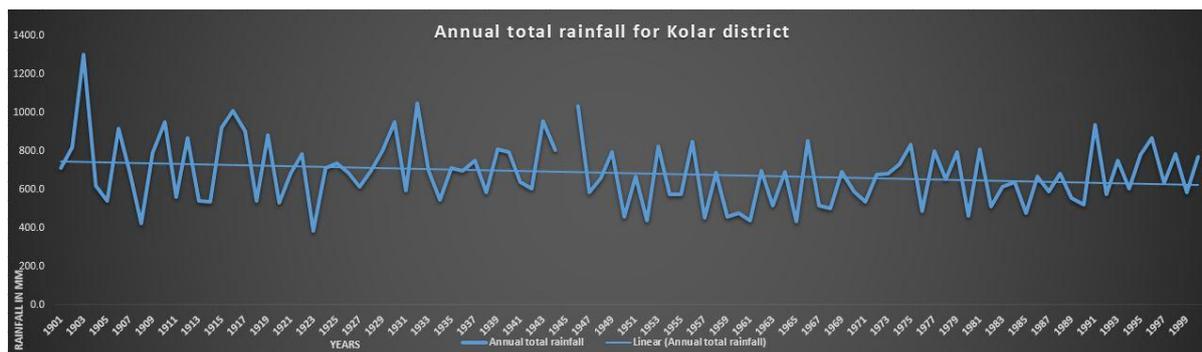
63rd Meeting in Oct 2012 considered the Yettinahole Diversion Project. EAC has recommended Environmental Clearance to Gundia (another wrong decision), whereas it has indicated that Yettinahole Diversion Project does not require an Environmental Clearance. In doing so, the EAC has not considered that both these projects plan to divert waters from the same catchments. This also says a lot about application of mind by the Expert Appraisal Committee. At the same time, it also raises questions about the coordination and work of Karnataka Government.

VI. Options Assessment



Annual Rainfall in Chikkaballapur District during 1901–2001 (Data Source: IMD, Graph: SANDRP)

¹ www.dnaindia.com/bangalore/1889546/report-govt-hiding-facts-on-yettinahole-say-activists, <http://articles.timesofindia.indiatimes.com/2013-09-12/mangalore/42007183> 1 [yettinahole-project-chikkaballapur-districts-water-problem](http://articles.timesofindia.indiatimes.com/2013-09-13/mangalore/42039865), [1 water-problem-drinking-water-supply-scheme-dams](http://articles.timesofindia.indiatimes.com/2013-09-13/mangalore/42039865)



Annual Rainfall in Kolar District during 1901–2001 (Data Source: IMD, Graph: SANDRP)

The project raises pertinent questions about water management and water sharing: Is diverting water from west flowing rivers, at a huge social, ecological and economical costs the only option to provide drinking water to Kolar and Chikkaballapur regions? Is there no other optimal solution? Did the Karnataka government undertake an options assessment study to arrive at such a conclusion?

An analysis of rainfall for the one hundred years (1901-2001) indicates that rainfall in Kolar and Chikkaballapur has not shown significant fall.

Kolar District, especially was once rich in water tanks and local harvesting measures. Average rainfall in Kolar is 750 mm, which is not low.

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According to the Karnataka Gazetteer, the district had, in 2012, only 2,095 tanks from the 35,783 tanks in 1968. Most of the tanks were a victim of siltation, encroachment and neglect. Organisations like Gramvikas and Dhan Foundation have demonstrated how desilting and management of tanks in Kolar can secure water for drinking as well as for irrigation, cattle rearing, etc. Some groups have worked on highlighting the positive impact of applying reservoir silt to crops, as

an option to fertilisers and to facilitate desilting. Indian Institute of Sciences (IISc) has demonstrated that desilting these tanks in Kolar can not only help water security, but it can also reduce the incidence of fluorosis.

River Rejuvenation Long distance water diversion is not an answer to drying and dying rivers. Rivers like Arkavathy are dying due to persistent pollution from industries and urban areas and also due to catchment degradation. How will waters from Yettinahole revive this situation? Local efforts, sound environmental and water governance however, can help this situation. But this is not being explored with any seriousness.

Long-distance water transfer: problems and prospects

If many of the past and present experiences on long-distance water transfer are reviewed critically, the following major issues emerge:

(1) Mass transfer of water is often justified by considering only the direct cost of transporting water. Seldom are the values of services foregone by the exporting region due to reduction of their water availability, i.e. the opportunity costs of exported water analysed.

(2) Various other feasible alternatives to inter-basin water transfer are often not investigated. There is a tendency within the engineering and economic professions to opt for technological solutions—"soft" options tend to be neglected. Since water resources development is dominated by these two professions, there is a tendency to opt for technological fixes before all viable alternatives are explored. Among possible options are:

- more efficient use of available water including demand side management;
- re-use of waste water;

-better management of watersheds;
-improved integration of surface and groundwater supplies;
-changing cropping patterns. (United Nations University, 1983)

VII. Conclusion: Environment and Social Assessment are basic prerequisites for a project of such massive dimensions.

All in all, looking at several serious issues associated with Yettinahole Diversion Project, it is urgently needed that:

- Project should undergo complete Environment appraisal and Clearance scrutiny, as laid down by the EIA notification, 2006
- Options Assessment and cost benefit analysis, including the ecological costs of the diversion should be carried out and put in public domain.
- Downstream affected communities, including cities like Mangalore and estuarine fisher folk should be consulted during public hearings.
- Unbiased assessment about the water stress in Kolar and Chikkaballapur should be carried out with members from groups which have been working from the region, to evolve a holistic water management policy for the region.
- Options for reviving rivers and tanks in Kolar-Chikkaballapur need to be explored using traditional

Climate change reports like the 4X4 Assessment have indicated that rainfall in southern Western Ghats, which also includes Netravathi and Gundia catchments, is expected to fall in the coming years. This will affect water resource projects, crops, fisheries, etc. We cannot ignore these signals while planning expensive schemes at the cost of ecology and society which might prove to be unviable in a few years in face of climate change. Keeping all these factors in mind Karnataka needs to proceed extremely cautiously on Yettinahole diversion scheme.

and appropriate technology practices. Appropriate cropping pattern and cropping methods should be a part of this exercise.

- A review of rain water harvesting, efficient water supply, demand management, lake revival, groundwater recharge, grey water and sewage recycling for cities including Bangalore should be carried out prior to allocating more water from distant sources to such cities.
- A democratic bottom up exercise has to be taken up on such proposals both in the Western Ghats areas as well as the projected benefiting areas.
- Recommendations of the Western Ghats Expert Ecology Panel about avoiding inter-basin transfers in the Western Ghats should be adhered to.

It will not be in the interest of the ecology in Western Ghats, Eastern regions or communities in Dakshin Kannada, Hassan, Kolar, Tumkur, Bangalore and Chikkaballapur if a project of such massive proportions, with devastating social and environmental impacts is taken up for short term political or financial gains, bypassing proper credible appraisal and democratic decision making.

Kolar and Chikkaballapur regions have been facing water problems, leading to hardships to local communities. But, for a long term and sustainable solution to these problems, Yettinahole Diversion does not look like a viable option, we do not even know how much water will reach these regions. But the project has the potential to exacerbate ecological degradation, fuel man animal conflicts and further water conflicts between regions.

Drought affected regions may have better options, including better operation and maintenance of existing water infrastructure, more appropriate cropping and water use pattern, revival of existing water harvesting structures, recycle and reuse of water, among others. Attention needs to be paid to these options, rather than 'diverting' it.

Hidden costs of projects like Yettinahole Diversion are too big to remain hidden.

Parineeta Dandekar

References:

[1] Volume II, Part B, Estimates, Section: Estimates for implementation of the scheme: Drawings

- [2] Minutes of the Meeting, 63rd EAC Meeting, MoEF held on 12-13th October 2012. Agenda Item 2.11 (B)
- [3] Pteridophytes are plants from the fern family that reproduce by spores.
- [4] <http://www.deccanherald.com/content/264870/researchers-stumble-species-fish.html>, Ichthyological Exploration of Freshwaters, Vol. 23, Number 4
- [5] <http://www.thehindu.com/news/national/karnataka/tanks-fast-disappearing-in-kolar/article4975328.ece>
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- [8] <http://sandrp.wordpress.com/2013/07/26/climate-change-in-western-ghats-4x4-report-and-beyond/>