Yettinahole diversion Project (literally) holds no water

Posted on May 21, 2015 by SANDRP 5 Comments

Above: *The modest Yettinahole Stream, close to location of proposed weir.* ***Photo****: Parineeta Dandekar*

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Debate over Yettinahole Diversion Project has been raging in Karnataka for more than two years now. While Dakshin Kannada has been rightly raising issues of unassessed social and ecological impacts of the project on this region, information now available, including Indian Institute of Science – Bangalo

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that **Yettinahole Diversion Project ju**
that the project developers claim it
hydrological foundation of the proje

The project would only prove a r
Chikkaballapur region, under whose

Despite very strong objections
technical and economic feasibility o
have been awarded to various agen
started, but it is stalled for the mome
the absence of Forest Clearance. Incidentally, as many as three petitions have been filed against this project in the Hon. National Green Tribunal, each raising a separate and strong issue. The biggest political parties in Karnataka, the Congress as well as the BJP support the project.

Protest in Hassan against Yettinahole Photo: The Hindu

SANDRP has visited the region multiple times and has been involved in the assessment of the project since 2013. We have analysed the original **Project Report**: https://sandrp.wordpress.com/2013/09/18/yettinahole-diversion-an-imprudent-rs-100-billion-proposition/ as well

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as the modified the **DPR**: https://sandrp.wordpress.com/2014/09/18/yettinahole-diversion-dpr-new-avataar-old-problems/.

However, as the project progresses, valid questions are being raised not only about the impacts of the project on Western Ghats and the downstream**, but the viability of the project itself**. Looking at information brought out by a number of experts from Karnataka, it is clear that Yettinahole Diversion Project, as it stands now, is based on **shockingly poor, unscientific hydrology and just does not have the water to quench the thirst of Kolar and Chikkaballapur, as claimed**. In the bid, the project is misleading not only Dakshin Kannada, but Kolar and Chikkaballapur too and taking these scarcity-hit districts further away from cheaper, faster, more reliable options.

SANDRP analysed the DPR, latest studies on the project and talked with experts to understand the intricacies of water availability in the Yettinahole Catchment and whether it will in fact be able to transfers 24.01 TMC (Thousand Million Cubic Feet) that it claims to Kolar Chikkaballapur and other regions.

Drinking water supply scheme at 50% dependability? First and the foremost issue which crops up in the hydrology of the project is that it is designed at 50% Dependability. This means that the scheme is designed in such a way that it will be able to transfer 24 TMC of water only 50% of the time that it functions. In the remaining 50% times, there will not be enough water to transfer. This is in the design itself! This has led to a heavily overdesigned project which will be unused for half the time it functions. Not only is this a waste of public resources, it is a severe flaw. Drinking water supply schemes (Yettinahole Diversion calls itself an exclusive drinking water supply project) are not designed at such low dependabilities. Drinking water is not a matter of gamble, but needs assured and reliable supply,

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and as a norm, drinking water supply schemes are designed at higher dependability of around 90-95%.

A. IISc Study, April 2015

Centre for Ecological Sciences (CES) of Indian Institute of Sciences (IISc), which is under The Ministry of Science and Technology, Government of India and the Ministry of Environment and Forests, Government of India has published a report in April 2015 titled: **Environmental Flow Assessment in Yettinaholé Where is 24 TMC to divert**? Authors are Dr. TV Ramachandran, Head of the Energy and Wetlands group of CES, Vinay S and Bharath Aithal. Findings of the report from this premier institute are striking:

1. **Yield of the entire catchment is just 9.5 TMC and not 24.01 TMC!**

This study points out that the yield of Yettinahole Catchment (including the 8 weirs of the Yettinahole Diversion Project) is 9.55 TMC and not 24.01 TMC as claimed by KNNL (Karnataka Neeravari Nigam Limited, Govt. of Karnataka). This is 60% less than the yield computed by KNNL!

According to IISc study, the KNNL's flawed yield calculations considering discharge measurements at station near Bantwal on Netravathi, much in the downstream than the diversion locations and using proportional area of individual catchments relative to the Bantwal catchment. Bantwal is more than 60 kms away from Yettinahole catchment, in a completely different hydro-ecological setting. ***Due to variations in rainfall across space and time, and also variations in land use, measurements at one location cannot be extrapolated to other regions so far away in the catchment.***

In contrast to this approach, water yield estimated by IISc is

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done using parameters at catchment level such as rainfall, land use, evaporation, etc. These show the water yield of 9.55 TMC which is about 40% of the yield obtained by DPR. Rainfall Data for this study has been compiled from sources which include Directorate of Economics and Statistics, Government of Karnataka, Indian Metrological Department (IMD), Government of India and Tropical Rainfall Measuring Mission (TRMM), NASA.

Compared with Karnataka Power Corporation's actual field monitoring, the efficacy of the model used by IISc is as good as 86%. The following table indicates the yields computed of IISC, as against the yields assumed in the DPR of the project by KNNL.

Below: Comparison of rainfall and yield calculated by KNNL vis a vis IISc **Source**: IISc Report

Catchment	Name	Rainfall in mm		Runoff Yield in TMC	
		DPR	Data compiled from IMD	DPR	Computed based on filed study
1	Yettinahole	6280	3539.7	**6.62**	**2.62**
2	Yettinahole T2	6280	4311.4	**1.40**	**0.58**
3	Yettinahole T1	6280	4110.0	**1.02**	**0.57**
4	Kadumane Hole 2	6280	4364.8	**1.73**	**0.53**
5	Kadumane Hole 1	6280	4725.5	**0.98**	**0.70**
6	Hongadahalla	6280	4000.8	**7.76**	**2.68**
7	Keri hole	6280	4013.1	**2.01**	**1.17**
8	Yettinahole Lower Reach	6280	4385.3	**2.51**	**0.69**

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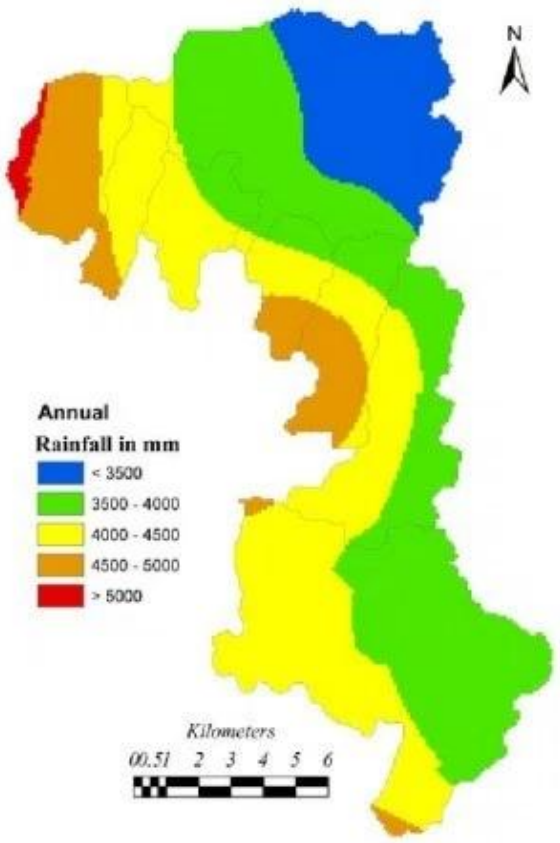
TOTAL	**24.03**	**9.55**



Rainfall Map of Yettinahole Project catchment. Shows that major area gets 3500-4500 mm rainfall **Source**: IISc Report

According to IISc study, the DPR has computed erroneously inflated yield because:

- considering uniform rainfall of 6280 mm in all catchments, though actual rainfall is in the range 3500-4700 mm,
- Non consideration of spatial variations in land cover / land use.

The DPR has not made ANY provision for evaporation losses from gravity canals, although these will be to the tune of 1 TMC.

The report concludes that: "*The inflated values of water yield in the catchment would only lead to the failure of water diversion scheme similar to Telugu Ganga Project. Implementation of the*

project would affect the livelihood of dependent population (current users in Yettinaholé catchment) and would not benefit the likely beneficiaries in arid regions of Karnataka."

2. **Available water is used in the Yettinahole catchment itself:**

IISc study states that the existing water demand in the catchment for drinking and domestic water, irrigation, plantations, fisheries and ecology and basin characteristics like precipitation, evapotranspiration, runoff, land use characteristics, topography, cropping profile and rotation, etc., all the yield of the Yettinahole watershed is utilized in the catchment itself , leaving no surplus, leave aside surplus availability of 24.01 TMC claimed.

As per IISc study, the water demand in the catchment is 5.84 TMC & water required for maintaining environmental flow is 2.84 TMC.

The section concludes: "*Yettinaholé diversion project if implemented will not help either the residents of arid regions in Karnataka (Chikballapur, Kolar, Tumkur) or local people in Gundia river basin. Residents of Yettinaholé catchment would be deprived of their right for water, while people in the arid regions would only get to see dry canals, etc. Implementation of Yettinaholé project would lead to water scarcity in Hassan and Mangalore, and will not benefit Chikkballapur, Kolar, etc. Livelihood of Yettinaholé and Gundia catchment would be affected severely due to lowered agricultural and fisheries yield similar to the residents of Nellore district with the implementation of Telugu-Ganga project. The project if implemented deprives the local people their right to water under Article 21 of the constitution of India.*"

Multi crop farming in Sakaleshpura Photo: Deccan Herald

Kadamane Tea Estate

Fishing in Netravathi

The expert report squarely rejects the YDP by stating: "The proposed project is ecologically unsound and economically unviable because of the following reasons:

1. The implementation of the project will cause large scale land cover changes in the region.

2. The proposed project would alter the hydrologic regime affecting the local ecology, biodiversity and more importantly livelihood of people in the region

3. The proposed project would cause habitat fragmentation

and shrinkage resulting in enhanced Human – Animal conflicts.

4. The forests are ecologically and economically beneficial to humans. The economic value of the region is higher (> 200 Billion Rs.) and emphasise the need for conservation to sustain livelihood of dependent population."

Options suggested by IISc Study include: (i) decentralized water harvesting (through tanks, ponds, lakes, etc.), (ii) rejuvenation or restoration of existing lakes/ponds, (iii) reuse of waste water, (iv) recharging groundwater resources, (v) planting native species of herbs and plants in the catchment, (vi) implementation of soil and water conservation through micro-watershed approaches.

B. Hydrology section in Yettinahole Project DPR

Before completing the December 2013 DPR of the Project, KNNL had worked on a Project Report of Yettinahole Project, dated June 2012. In the Project report, yield was calculated using precipitation data from regions near the weir sites like Tea estates. The yield computed was 24.01 TMC. The DPR on the other hand, used a completely different method by extrapolating flows from data available at Bantwal. Although there is a vast difference between the two methods, the yield computed is miraculously same to the last decimal at 24.01 TMC! For the entire catchment of 8 weirs in an area of 174 sq kms, rainfall assumed is 6280 mm, which, the DPR states, is from "*rainfall records maintained by owners of plantations in the region.*" (DPR Page 110) This assumption is extremely bloated.

Shockingly, although the KNNL found that divertible yield was slightly less, it still went ahead with 24.01 TMC diversion without any justification. The only "justification" given is: "*According to the revised computations, the divertible yield has been assessed as 22.14.TMC. However, Prof. Rama Prasad, who has conducted the*

Hydrology studies, has opined that the yield of 22.14 TMC at 50% dependability is very much on a conservative side and 24.01 TMC of divertible yield is available across the streams. This has been taken note of and for the present proposal, 24.01 TMC of water has been considered as the divertible yield from the selected streams to proceed further regarding finalization of the scheme in total."

Can there be a more unscientific way of approaching hydrology, which is at the heart of Yettinahole Project?

C. Discussion with Prof. S.G. Mayya, Department of Applied Mechanics and Hydraulics, National Institute of Technology, Suratkhal:

Prof. Mayya has been raising pertinent issues [i]about the Yettinahole Project for several years now and has studied the region as well as the project in detail. In a discussion with SANDRP he states: "First of all, it is not Yettinahole diversion, it is Netravathi Diversion. It would have been Yettinahole Diversion if water only from Yettinahole catchment and its sub-catchments was diverted, but here 90% of water being diverted is from the downstream of Yettinahole catchment, actually from the Netravathi catchment. So calling it Yettinahole Diversion is misleading and fraudulent. I don't know why the government continues calling it Yettinahole Diversion."

"Secondly, even if we assume excessive rainfall in the catchment, yield of the entire catchment will not exceed 8 TMC-10 TMC. Any study which assumes yield to be 24.01 TMC is flawed and misleading."

"Thirdly, any water diversion project so far, even those under Interlinking of rivers, and National Water Development Agency conduct at least a perfunctory study to ascertain if the river basin from where water is to be diverted is surplus or not. It is also studied, before initiating any transfers, if the water to be

diverted can be used in the same basin for optimal use. No such study has been carried out for Netravathi. Where the data which proves Netravathi is a surplus basin? What studies have been conducted to understand the preset water use pattern in the basin and future projections? In the absence of any such data how can our own state government push this project?"

D. Discussion with Dr. Yadupati Putty[ii], National Institute of Engineering, Mysore (Water Resource Engineering Specialist)

"We have installed real time monitoring stations in the region and KNNL's claim of uniform 6280 mm rainfall in all 8 catchments is clearly incorrect. There is 1000 mm difference even in a short span of 4-5 kms in the region. How can the KNNL base its claim on uniform rainfall? The divertible yield as calculated by us is around 5-8 TMC and not more than that." As Dr. Putty's presentation in Institute of Engineers, Bangalore eloquently pointed out: "Changing the attitudes is far more difficult than changing the landscape!"

E. What Anjaneya Reddy, farmer Leader of the Shashwat Neer Horata Samiti from Kolar says:

"We do not want to take water from Dakshin Kannada. In fact, we think that Yettinahole Diversion is a political ploy, for political gains and Kolar and Chikkaballapur regions will not get enough water from this. We want sustainable solutions to our problems, not Band-Aid solutions."

Some Questions for Karnataka Government / KNNL

As the Karnataka government is using tax payers money to push Yettinahole Diversion Project in the name of Kolar and Chikkaballapur (a huge amount: Rs 13000 Cores, the amount will keep mounting with every passing day), Karnataka Government needs to respond to a number of questions:

1. **Why is a Rs 13,000 Crore Rs scheme being based on an extremely bad hydrological data? Why is it that scientists from acclaimed organizations like IISc and other experts are calling Yettinahole Diversion a fraud? What is the reason behind considering uniform precipitation in the catchment? Why are evapo-transpiration losses and en-route transportation losses not considered in the water balance of the project DPR?**

2. **If Yettinahole Diversion is truly a drinking water supply scheme, why is the Project designed at 50% dependability? 50% dependability means that the project will be able to divert 24.01 TMC only 50% of times, half of the time promised. Drinking water supply projects are designed at 90-95% dependability as drinking water has to be an assured resource, not a 50-50 gamble.**

3. **Are the people of Kolar and Chikkaballapur aware that they will get promised amount of drinking water from this project at most only 50% of times.**

4. **Why has the Karnataka Government conducted no study to understand water use in the Yettinahole and Netravathi catchment and the impact of this diversion on the basin residents including the ecosystem?**

We look forward to responses from KNNL or Karnataka Government. We hope that the Karnataka government will not force an unviable, costly, environmentally and socially destructive project on the people of the state.

***-Parineeta Dandekar (parineeta.dandekar@gmail.com)*, SANDRP**

POST SCRIPT: It seems (see: http://wrmin.nic.in/forms/list.aspx?lid=356) the project is proposed for Japan International Cooperation Agency. The MoWR website says: "A project proposal has recently been received from Government of Karnataka for implementing

Yettinahole Project with funding from JICA.

The broad objectives of the project are:

- To lift 24.01 TMC of water, diverting water from west flowing streams in the upper reaches of Western Ghats near Sakleshapura to the east by supplying in bulk for drinking purposes and ground water recharge by filling Minor Irrigation tanks.
- To mitigate the drinking water shortages in the seven districts: Hassan, Ramanagara, Chikmagalur, Bangalore rural, Tumkur, Kolar & Chikkaballapur.

Comments of Ministry of Drinking Water & Sanitation, CWC and CGWB have been sought on the proposal."

END NOTES:

[i] http://www.mangalorean.com/printarticle.php?arttype=localnews&newsid=342779, http://timesofindia.indiatimes.com/city/mangaluru/Nethravathi-or-Yettinaholey-will-Western-Ghats-survive/articleshow/21297248.cms

[2] Earlier SANDRP blogs on this project:

1. https://sandrp.wordpress.com/2014/09/18/yettinahole-diversion-dpr-new-avataar-old-problems/;

2. https://sandrp.wordpress.com/2014/01/30/open-letter-to-dr-veerappa-moily-as-he-supports-foundation-stone-laying-of-yettinahole-diversion-project/;

3. https://sandrp.wordpress.com/2013/09/18/yettinahole-diversion-an-imprudent-rs-100-billion-proposition/;

4. https://sandrp.wordpress.com/2013/09/10/complete-

appraisal-needed-for-yettinahole-diversion-project-letter-to-moef/

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