

Ecological and Social Viability of Human River Project

Human River Project
Taluka: Sindewahi
Dist: Chandrapur

Background

This a major irrigation projects to be built across Human River in the Wainganga/ Godavari basin near Village Sirkada in Sindewahi Tahsil. The Human is a tributary of the Andhari River which ultimately joins the Wainganga. The proposed project's location is near village Sirkada in Sindewahi tahsil of Chandrapur district and it aims to divert 132 cu. mm. water to MSEB's Chandrapur Thermal Power station.

The total submergence area is 6173 Ha with Rs. 42347.20 lakhs investment. The details of submergence is as follows:

Revenue 528 ha
Private 4109 Ha
Forest 1535.85 Ha
Total 6173 Ha

The proposal was submitted to MoEF. The Forest Clearance Advisory Committee of the MOEF suggested reducing the extent of submergence by lowering the FRL by one metre to 28mt which would result in a reduction of the submergence area from 2906.28 ha to 1925.55 ha. of forest land. The number of submerged villages would fall from 17 to 15. The concerned authorities subsequently settled to reduced the dam height by 1m. After several deliberations, MoEF has given approval to the revised site clearance (from survey and investigation point of view).

Project site:

The submergence and down stream area is a tiger corridor between Tadoba Andhari Tiger Reserve and other PAs in Satpuda- Maikal tiger landscape.

Objective:

To assess the biodiversity of the submergence area.

Assess the viability of the project in this context of biodiversity.

The data thus collected will be helpful to compare with the EIA document (if any) prepared by project authorities.

Project Team:

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Kishor Rithe (Nature Conservation Society, Amravati)

Ashish Fernandes (Sanctuary-Asia)

Dr. Wankhade, Head of the Zoology Department, University of Amravati

Mr. Jayant Wadkar, Lecturer, University of Amravati

Atul Dhamankar (Green Pigeon Nature Society, Chandrapur)

Site Visit Schedule

29.9.2002

Meeting with Mr. Sanjay Thakre, DFO, Chandrapur Division was arranged to get an insight on the wildlife status of Chandrapur division of Territorial Forest. This area is adjoining to the submergence area due to Human Project. Mr. Thakre provided valuable information on presence of tiger and other endangered wildlife. He also provided cattle kill data to strengthen the fact that tiger and leopards occupy the area. Subsequently meeting was arranged with Mr. Nitin Kakodkar, DCF, Tadoba for further insight on the issue. Several important documents were procured from various offices.

30.9.2002

Visit to dam site (from Chandrapur Range) and submergence villages

Kolsa Rest House

(N 20° 09' 53.9" / E 079° 30' 18.3" / Alt: 252 m / Track 321⁰)

Palasgaon

(N 20° 21' 33.4" / E 079° 27' 48.1" / Alt: 239 m / Track 106⁰)

This is one of the submergence villages with 1200 house holds with affected population of 2092. Main occupation of the villagers is Paddy cultivation and fishing. The village also has large perennial village pond called Badak-Palasgaon pond. There are 65 fishing members belongs to Dhivar community who has fishing rights in the pond.

Piparda-Parna

(N 20° 19' 45.2" / E 079° 30' 17" / Alt: 245 m / Track 315⁰)

This is also submergence village. Good quality forest patch (compartment 231, Bit Sirkada) exist at this location. The adjoining area has few large ponds that irrigate paddy cultivation.

Sirkada

(N 20° 18' 52.7" / E 079° 31' 23.5" / Alt: 230 m / Track 004⁰)

Village will be fully submerged after dam construction is over and also the dam site. Total affected population of the village is 624.

Human Dam site

(N 20° 18' 56.2" / E 079° 32' 16.9" / Alt: 237 m / Track 004⁰)

This is the narrowest wildlife corridor in entire submergence zone. Two quadrates were laid in this area and detailed flora and fauna is documented. The list is attached separately (Annexure 1). This is approach to dam from Chandrapur Division.

In Human River Bed

(N 20° 18' 58.6" / E 079° 32' 16.7" / Alt: 218 m)

This is the exact location where dam is proposed. The flow of water was negligible at this point. Locals use the riverbed for fishing from September to December. The flow dries after December.

1.10.2002

Visit to dam site (from Brahmapuri Range) and submergence villages

Hatti Gota Nala

(N 20° 23' 51.9" / E 079° 25' 41.6)

This is one of the important feeder channels to Human River. The entire area comes under full submergence including Vihirgaon. The Nala originates in Ali Zanza and meets Human River at Vihirgaon.

Manmohadi

(N 20° 24' 13.1" / E 079° 24' 21.5" / Alt: 239 m / Track 293⁰)

Fully submergence village. Affected population is 707.

Mhasali

(N 20° 24' 35.3" / E 079° 23' 08.3" / Alt: 247 m / Track 311⁰)

Partial submergence village with affected population of 191. From this point we crossed over to other side of Human via Chimur.

Chimur

(N 20° 29' 40.6" / E 079° 21' 56.1" / Alt: 249 m / Track 232⁰)

With initial proposal of dam with dam height of 38 mts, large part of Chimur was under submergence. To avoid this the dam height was reduced initially. After reduction of FRL by 1 meter, no area is now under submergence.

Neri

(N 20° 28' 19.8" / E 079° 26' 52.4" / Alt: 250 m / Track 175⁰)

At this point Uma River continues as Human River. Locals refer the riverbed above this area as Uma River that continues to flow downwards and become Human River. However Uma and Human is the name of the same river. Partial submergence village (only agriculture land) with affected population of 90.

Khambada Nala

(N 20° 24' 18.1" / E 079° 28' 23.3" / Alt: 232 m / Track 155⁰)

This is the site where Godhakka Nala meets Human River. There is a proposed check dam to avoid overrun of Human flow after the dam. This area is under partial submergence. Affected population is 678.

Khambada

(N 20° 24' 18.1" / E 079° 28' 24.3)

This is also partial submergence village with affected population of 678. Here we interacted with Mr. Harishchandra Bambole from Irrigation Department. He clearly said that all minor irrigation projects are working properly and farmers pay Rs. 497/- per acre as water charge.

Gondeda

(N 20° 23' 57.9" / E 079° 28' 36.2" / Alt: 246 m / Track 095⁰)

Entire area has secondary forest cover. It is partial affected village with population of 744.

Kewada

(N 20° 24' 05.1" / E 079° 29' 41.1" / Alt: 249 m / Track 083⁰)

This is a vital corridor through the secondary forests of Gondeda. It is also partially affected area with a population of 178.

Pendheri

(N 20° 23' 43.8" / E 079° 32' 50.4" / Alt: 275 m / Track 293⁰)

The entire area has very good forest cover (compartments 45,46 and 47).

Navargaon

(N 20° 21' 49.3" / E 079° 34' 37.6" / Alt: 254 m / Track 123⁰)

Human Dam site

(N 20° 19' 00.0" / E 079° 32' 17.7" / Alt: 226 m / Track 223⁰)

This is the approach to dam site from Brahmapuri Division.

Human Dam Colony

(N 20° 20' 17.3" / E 079° 32' 35.9" / Alt: 242 m / Track 275⁰)

Revenue land: Group no 1105 (old number) Group no 1291 (new number). Area: 9.79 hect. This colony was built in 1984 on Revenue Land and was occupied till 1994. There are total 18 blocks with 144 houses, 5 warehouses (appx 100 ft x 20 ft), 6 incomplete plinth construction, 2 fresh water wells, and access road. The colony was built for the construction of scurting wall.

Sindewahi

(N 20° 17' 25.9" / E 079° 39' 25.9" / Alt: 228 m / Track 266⁰)

Kalamgaon Ganna

(N 20° 13' 55.5" / E 079° 37' 41.1")

Pangdi

(N 20⁰ 11' 06.1" / E 079⁰ 33' 53.6")

Kolsa Rest House

2.10.2002

Visit to Corridor and minor irrigation projects

Kolsa Rest House

Pendheri

(N 20⁰ 23' 43.8" / E 079⁰ 32' 50.4" /Alt: 275 m / Track 293⁰)

Kacchipar

(N 20⁰ 25' 40.8" / E 079⁰ 33' 38.4")

Govindpur

Sindewahi

(N 20⁰ 17' 25.9" / E 079⁰ 39' 25.9" /Alt: 228 m / Track 266⁰)

Meeting with Mr. R.M. Pawar, RFO Sindewahi Range was very useful. Mr. Pawar provided vital data of cattle kill in his range. Large area (30% from Brahmपुरi Division) from this range comes under FDCM (Bit no. 168, 169, 171, 170, 172, 173). Left canal of Human Dam passes through Sindewahi and Nagbhid Range. The forest cover is very good and recent incident of tiger deaths due to poisoning occurred in Chicmara (compartment 176 and 177) of Sindewahi Range.

Chicmara Bit 177

(N 20⁰ 14' 25.5" / E 079⁰ 45' 11.4" /Alt: 268 m / Track 144⁰)

First (female) tiger recovered dead by poisoning

Chicmara Bit 176

(N 20⁰ 14' 26.7" / E 079⁰ 45' 01.8" /Alt: 254m / Track 293⁰)

Second (male) dead tiger recovered from this location.

Chicmara Bit 176

Third (male) dead tiger was traced to this site.

After the visit to these areas, we had planned to visit few minor irrigation projects, which are already functional in the affected areas due to dam.

Asolamedha Minor Irrigation Project

(N 20⁰ 12' 53.2" / E 079⁰ 49' 29.9" /Alt: 237 m / Track 004⁰)

LSL: 208.23m

FTL: 213.7m

Total area benefited: 50859 hect

Cultivable land: 37945 hect

Proposed irrigated land: 9919 hect

Sindewahi

(N 20⁰ 17' 25.9" / E 079⁰ 39' 25.9" /Alt: 228 m / Track 266⁰)

Rajoli

(N 20⁰ 11' 18.6" / E 079⁰ 41' 12.7" /Alt: 223 m / Track 120⁰)

Chikhli

(N 20⁰ 09' 16.5" / E 079⁰ 41' 10.0)

Bhasbodan Talao

This is another minor irrigation project in the left canal of the Human Dam. This is also proposed site for rehabilitation of few affected villages.

Kanhal Gaon

(N 20⁰ 08' 29.6" / E 079⁰ 43' 25.9" /Alt: 223 m / Track 201⁰)

Good quality forest cover exists in this area. Several private land holdings also exist.

3.10.2002

Visit to villages in command area of Right Bank Canal

Kolsa Rest House

Piparatti

(N 20° 15' 36.4" / E 079° 32' 19.8" / Alt: 241 m / Track 057⁰)

This is the boundary of Tadoba-Andhari Project Tiger. Two nests of White-backed Vultures were sighted. Subsequently, Mr. S. Khobragade and Mr. R.T. Moherle, Forester took us to the nesting and roosting site of White-backed Vultures in Upasha Nala near village Pandharvani. Total 5 nests and 11 White-backed Vultures were seen. Fresh tiger footprints were also recorded in Upasha Nala. Upasha Nala ultimately meets Nalleshwar Reservoir.

Vasera

(N 20° 16' 32.3" / E 079° 33' 57.6" / Alt: 225 m / Track 056⁰)

A large perennial village pond provides water for paddy cultivation.

Nalleshwar Minor Irrigation Project

(N 20° 13' 54.2" / E 079° 34' 58.5" / Alt: 238 m / Track 116⁰)

It was built in 1914 and functional. However it is not been utilized to its full capacity. Several locals still demand its full utility.

Mul

(N 20° 03' 55.4" / E 079° 40' 46.3" / Alt: 223 m / Track 278⁰)

Chichala

(N 20° 13' 34.1" / E 079° 46' 29.9")

Haldi

(N 20° 00' 30.0" / E 079° 40' 54.3")

Bhejgaon

(N 19° 59' 12.8" / E 079° 41' 25.7")

Chintala

(N 19° 58' 39.6" / E 079° 41' 18")

Regdi (Tola)

(N 19° 58' 00.3" / E 079° 40' 46.1")

Pepri Dixit

(N 19° 57' 10" / E 079° 40' 20.1")

Chuck Ghosari

(N 19° 55' 38.0" / E 079° 39' 44.4")

Thergaon

(N 19° 54' 34.4" / E 079° 39' 20.4")

All the above villages such as Chichala, Haldi, Bhejgaon, Chintala, Regdi(Tola), Pepri Dixit, Chuck Ghosari and Thergaon have large village tanks which are perennial. There is large lift irrigation project under construction at Thergaon.

Dewada

(N 19° 54' 24.7" / E 079° 37' 44.6")

Jam Tukum

(N 19° 55' 20.3" / E 079° 37' 32.1")

Jam Khurd

(N 19° 55' 54.8" / E 079° 38' 01.7")

Charoli

(N 19° 59' 53.5" / E 079° 36' 41.7")

Villages like Dewada, Jam tukum, Jam Khurd and Charoli have functional Minor Lift Irrigation project.

Kolsa Rest House

4.10.2002

Visit to Corridor in submergence area

Kolsa Rest House

Navargaon

Nainpur

(N 20° 23' 28.5" / E 079° 33' 07.7" / Alt: 263 m / Track 099⁰)

The Kewada irrigation canal of Ghodezari Irrigation Project irrigates this area. There are several minor irrigation canals supplying irrigation water such as Kewada, Girgaon, Zadburi.

Kacchepar

(N 20° 25' 40.8" / E 079° 33' 38.4")

Site Visit Report

The site visit was conducted from 29th September 2002 to 8th October 2002 to assess ecological and social viability. Various areas affected due to project including fully submerged villages, partially submerged villages and villages with affected agriculture lands were visited. Visits were also made to command areas of left and right canals of Human Dams. Special efforts were made to locate village tanks and identify its present status. Entire area was assessed in terms of corridor potential. There are several important points needs to be addressed while talking about ecological and social viability. These points are discussed in detail as under.

- 1. Corridor under submergence and impact on biodiversity:** The fully submerged villages such as Palasgaon, Pipara-Perna, Sirkada (south of Palasgaon) and villages such as Vihirgaon, Manemohadik, Khambada, Gondeda, Kewada, Pendheri (on north of Palasgaon) is the narrowest corridor exist between Chandrapur and Brahmapuri Division of Reserve Forest. In few areas forest is scrub type while as in certain areas good quality forest exist. To confirm the forest cover as visible from GIS image, extensive ground truthing was done in this area. The entire area has very good forest cover where as few patches are scrub forest. There are ample evidences to suggest that the area under submergence have good population of endangered species such as tiger, leopard, sloth bear and wild dogs. Appendix I give the details of cattle kills in the corridor villages, which are under submergence, and villages adjoining the corridor that are not under submergence. Appendix II to V gives the complete checklist of birds, plants, butterflies and other insects and fish fauna respectively in the area under submergence. Appendix VI gives results for quadrat studies. Three important points which needs attention here are **(a)** It is also important to note that the area adjoining the submergence zone is a Reserve Forest which falls in Chandrapur Division. This area further continues with Tadoba-Andhari Project Tiger on west. Though the EIA report says that the distance of submergence area is 10 k.m. from the Project Tiger, it is just with in two k.m. from Reserve Forest; This distance is very meger when we look at the movement of large carnivores, herbivores and avian fauna **(b)** few villages from this area are under part submergence (either village land or agriculture land). This will definitely put pressure on Reserve Forest for grazing needs of these villages since the existing grazing lands will be under submergence. The cattle kill data clearly indicates the amount of proximity of people and wildlife. The additional cattle heads in the proximity of Reserve Forest is an open invitation for man-animal conflict. **(c)** It is also interesting that the DFO, Chandrapur Division has already forwarded his proposal to Chief Conservator of Forests of bringing this vital forest area under the administrative control of Tadoba-Andhari Project Tiger looking at its biodiversity potential. According to the 2001 tiger census figures, there are 18 tigers.

The interactions with local farmers revealed that species like spotted deer, sambar, leopards and tigers visit areas like Hatti Nala, which is one of the important feeding nalla to Human River. This area is under full submergence.

2. **Water Availability:** During the site visit it is clearly evident that each village has a village pond, which they call in local language as 'Bowdi'. These are perennial water bodies. Farmers commonly take two crops. Paddy being the main crop is mainly irrigated on rainfall. However just before harvesting, irrigation from these village ponds is essential since monsoon gets over this time (October). The second crop however is completely done on these Bowdi's. Paddy is main cash crop for local economy while as second crop is mainly to meet domestic needs. Besides agriculture, each village has a small population of fishermen. In Palasgaon, which is under submergence, has a fishing population of 65 who get their livelihood from the village pond called 'Badak Talao'. The situation is virtually same in most villages that are under full submergence where every village has large water body. Thus the issue of water scarcity is purely management issue. There are various methods now known to improve water-holding capacity of such water bodies. Few immediate measures such as Desiltation of these tanks, checking seepages, and avoid distribution losses will defiantly improve water availability.
3. **Issues related to fishing and Impact on aquatic fauna:** Important fact that has emphasized in the EIA document is that the dam will give an additional income generation avenue in term of fishing. We had disastrous examples, where it took almost 15 years to control fishing in Pench National Park. As it is now clear that the submergence area is the narrowest corridor, and in close proximity to Reserve Forest, fishing will add a new dimension to the already existing problems such as grazing, cattle kills etc. This lucrative and virgin fishing ground (if dam happens) will bring in three major issues
 - (a) Fishing populations with commercial interests will surely settle along the banks of dam.
 - (b) This will certainly displace traditional fishing since locals are not used to use newer fishing gears nor they have means to procure them. This will by and large wipe out traditional fishing practices as used by locals at this point of time who fish in the streams for a very brief period of five to six months.
 - (c) The locals with their lands and livelihood will be displaced in the name of dams where as commercial interests will settle in these areas in form of fish cooperatives whose real benefits will make rich more richer and poor more poorer, thus defeating the idea of livelihood to locals as proposed in the project. Also it is interesting that all the submergence villages will be resettled in four different Villages. Viability of these settlements is discussed separately.
 - (d) As a practice else where, cash crop fish species such as *Tilapia mozambica* will be introduced. These are not only fast growing, they spawn very rapidly and highly carnivore. This with out doubt will wipe out all native fish fauna.
4. **Rehabilitation sites and its viability:** Ashish add four sites and water availability. Also mention rehabilitation of people from well irrigated area to Thergaon which is water scarce area. Whether people will accept such rehabilitation?
5. **Existing pressures on Tadoba-Andhari Tiger Project;** Atul add text here.
6. **Agro-Economy;** Kishor to make note
7. **Loss of forests and impact on rain fall**
8. **Legal aspects and violations:**

- (a) **Completion of colony and sub-bund:** As part of the Human project, a housing colony was partially constructed at Nawargaon in the early 1980's and work on a sub-bund for the project was also completed prior to 1985. The question of how this work was completed in the absence of central government clearances must be looked into. Unless complete clearance is received from all central agencies, project work should not be allowed to proceed. Additionally, the expenditure already incurred on the above two activities must not be used as a justification for permitting the entire project to go ahead. The colony site is a fairly large one on the boundary of forestland. Why is the project authorities then asking for an additional site for a labour colony at Sirkada?
- (b) **Public hearing:** The public hearing for the Human project was reportedly held on November 26, 1999 at the Collector's office. However, since the EIA report was only prepared in December 2001, on what basis was the public hearing conducted, a full two years before the EIA report was released? And how was the "public" made aware of the costs and benefits of the project? As per the EP Act, the EIA should be prepared before the public hearing is held. This raises the question of legality of the public hearing, as the EIA report is necessary to hold an informed and genuine public hearing. The procedure for Public Hearing given in schedule-IV of Environmental Impact Assessment Notification 1994 has not been followed here. The public hearing panel was not as per the composition given in the aforementioned notification. The minutes attached in the report shows that this 'hearing' was little more than a meeting under the chairmanship of the Collector and in the presence of then Minister Shobha Phadanvis.
- (c) **The issue of whether the collector's office is a suitable venue must also be looked into.**

9. **Full utilization and maintenance of existing village ponds, lift irrigation projects and minor irrigation projects:** The Total Annual yield of the project is expected to be 406.773 mm³, however 132 mm³ of this will go to Chandrapur Thermal Power station and 15% (34.20 mm³) reservation for drinking water supply to Chandrapur and surrounding villages. That means the remaining 240 mm³ water will be utilised to irrigate this 35,750 ha agricultural land surrounding the RBC and LBC.

The survey team visited several existing irrigation projects in both the submergence and downstream areas of the project, from traditional village tanks and ponds to minor irrigation and lift irrigation projects. (Palasgaon, Asolamendha, Nalleshwar, Bhasbodan, Vasera, Bhejgaon, Chintala, Regdi, Pepri Dixit, Chuk Ghosari, Chiroli, Ghodazari and lift irrigation projects such as Dewada, Jam Tukum and Jam Khurd and Thergaon).

It was observed that the entire area for the most part has a good network of irrigation canals from such small projects, enabling villagers to raise at least one crop, and in many places two crops. Additionally, many of the minor irrigation projects already constructed are still not utilized to maximum capacity as canals have not been fully constructed or there are leakages and breaks.

A survey of the region around the LBC revealed a fairly extensive canal network created during the past decade, when this proposal was under submission. These canals are fed by the Ghodazari Irrigation project and Asolamendha irrigation project, as well as numerous

other smaller projects. Many villages are already raising two crops with this water. There is also considerable scope for increasing the coverage of these projects through dredging and desilting work and repairing and extending the canals.

When this team surveyed the area around the RBC in Mul and Sindevahi tahsil we found that Nalleshwar minor irrigation project, (fed by the nala generating from Kolasa area of TATR) is already irrigating the region. Upasa nala adding irrigation potential of Wasera tank. However the villages surrounding Thergaon and Pombhurna in the downstream area do require irrigation facilities. In the past five years, several lift irrigation projects like Thergaon and Dewada khurd on the river Andhari have been completed or are in the process of completion. These will fulfill the irrigation requirements of many of the villages in the command area of the proposed Human project, such as like Chuk Bembal, Chuk Ghosari, Chuk kosambi.

Thus minor irrigation and lift irrigation projects can together fulfill the needs of the command area. Many of these projects have come up after the Human project was first proposed. Hence the need for the Human dam should be re-looked at in the context of the present scenario.

Additionally, existing lift irrigation projects downstream of the proposed dam may be adversely affected by a drying up of the river after the dam is completed. In the submergence area too, a large number of tanks, lakes and minor irrigation projects, such as the lake at Pallasgaon, exist. These serve to meet the requirements of the villages in the submergence zone. Thus, a fertile and well-irrigated area will be lost if the dam comes up.

The present budget of the Human project is Rs. 423.47 crores and this is likely to escalate further. If a tiny fraction of this amount was instead allotted to increasing the efficiency of existing irrigation projects through dredging and desilting work, repairing canals and completing the canal network, the irrigable land would be increased in a much wider area than only the command area of the Human project. In addition, a large amount of employment would also be generated in the region. According to irrigation department data, across the country, 4.52 million hectares can be added to irrigated area by the utilisation of full potential of medium and major irrigation structures. Another 4.29 million hectares will be added by the full utilisation of the installed capacity in minor projects. (Ref: India Country Study, World Commission on Dams).

Water use efficiency is estimated to be about 38-40% for canal irrigation and 60% for groundwater schemes. According to 9th plan estimates, a 10% increase in water use efficiency of existing systems would be equivalent to the creation of an additional 14 million hectares of irrigated area!

In addition to the projects already constructed, several more are at various stage of construction, such as the Thergaon Lift Irrigation Project. Bearing in mind that this project was first proposed almost 20 years ago and many other irrigation projects have been conceived in the interim, it is necessary to do a complete re-evaluation of the irrigation requirements of the area. The option of cultivating a second or third crop (as the case may be) with low water requirement must also be looked at seriously.

Across the country, the performance of minor irrigation projects has been of a much higher standard than large projects, in terms of irrigation potential created.

Throughout India, the estimated gap between irrigation potential created and utilised was 8.8 million hectares, by 1997. Out of this, major and medium schemes accounted for 4.7 million hectares. This gap has been increasing with each plan period. (Ref: India Country Study, World Commission on Dams).

It would be better to first invest scarce resources in ensuring that all existing projects perform to their full potential. Such options if fully explored, will save the state considerable expenditure and resources that a large project like the Human dam will require, as well as preventing the ecological damage it will entail.

Furthermore, the network of traditional village tanks in the submergence area, such as the large lake at Palasgaon, also support a variety of biodiversity. In Palasgaon, a large percentage of the village is partially dependent on fisheries from the lake for their livelihood. The wisdom of submerging a relatively fertile and well-irrigated area to irrigate other areas is doubtful, especially when other options exist.

Incomplete projects and its impact (Ghose Khurd): The Ghose Khurd dam on the Wainganga river in Bhandara district is presently incomplete due to a lack of funds and the failure of the government to rehabilitate the Project Affected People. How can the state government ensure that a similar fate does not await the Human project?

10. **Analyse and review benefits due to dam as proposed in EIA of Human Dam: Ashish add Kishors note here**
11. **Impact of failure in monsoon on water availability of dam and feeder channels**
12. **Project review should be done by Project Tiger Steering Committee:** As presented in the Annexure I (cattle kill data) and wildlife census data available with forest department, it is clearly evident that the area has a tiger population of not less than 30 tigers (both including Chandrapur and Brahmapuri Division of Territorial Forest). This number is much larger than even entire tiger population of Western Ghats of Maharashtra, Goa and Karnataka. Thus Project Tiger Steering Committee must review the Human Project.
13. **World Commission on Dams:** The World Commission on Dams, an international body set up to look into the economic social and environmental pros and cons of dams has made several recommendations with a view to ensuring that the problems with the construction and implementation of new projects are minimized. It would be useful to look at some of these recommendations in the light of the Human project.

Needs Assessment

Needs assessment: validating the needs for water and energy services. Confirmation is required that plans for water and energy development reflect local and national needs adequately and accurately. An appropriate decentralised consultation process must be used to validate the needs assessment. In the case of the Human project, such an assessment needs to be done, particularly as many years have elapsed since the project was first proposed.

Participatory decision-making

This would require consultation between the project proponents and those most affected by the dam, that is the villages to be displaced and whose land and houses will be affected. Such a process of consultation must be fair, and seen to be fair, to all concerned.

In addition, the process must only take place in the presence of all the required information, made available to all stakeholders. Neither of these aspects appear to have been followed in the case of the Human project. Not only is the level of awareness about the project negligible among the villages to be displaced, but the public hearing was also held a considerable distance from the affected area and in the absence of information about the project itself.

Comprehensive Options Assessment

Alternatives to dams do often exist. To explore these alternatives, water, food and energy needs are assessed and appropriate strategies devised from a range of possible options. The ideal option must be decided based on an assessment process which gives equal weightage to social and environmental aspects as economic and financial factors. There has been no effort in this case to look at alternatives (demand-side management as well as watershed management, village tanks, lift irrigation projects etc) that can meet the genuine water needs of the region.

Ecological and Social Viability of Human Dam

Appendix 2

Bird List

Sr. No	Common Name	Scientific Name
1	Little Grebe	Podiceps ruficollis
2	Little Cormorant	<i>Phalacrocorax niger</i>
3	Cormorant	<i>Phalacrocorax carbo</i>
4	Grey Heron	<i>Ardea cinerea</i>
5	Purple Heron	<i>Ardea purpurea</i>
6	Pond Heron	<i>Ardeola grayii</i>
7	Cattle Egret	<i>Bubulcus ibis</i>
8	Large Egret	<i>Ardea alba</i>
9	Little Egret	<i>Egretta garzetta</i>
10	Chestnut Bittern	<i>Ixobrychus cinnamomeus</i>
11	Openbill Stork	<i>Anastomus oscitans</i>
12	Black Ibis	<i>Pseudibis papillosa</i>
13	Lesser Whistling Teal	<i>Dendrocygna javanica</i>
14	Garganey	<i>Anas querquedula</i>
15	Cotton Teal	<i>Nettapus coromandelianus</i>
16	Blackwinged Kite	<i>Elanus caeruleus</i>
17	Honey Buzzard	<i>Pernis ptilorhyncus</i>
18	Shikra	<i>Accipiter badius</i>
19	White-eyed Buzzard Eagle	<i>Butastur teesa</i>
20	Crested Hawk-eagle	<i>Spizeatus cirrhatus cirrhatus</i>
21	Crested Serpent-eagle	<i>Spilornis cheela</i>
22	Indian Whitebacked Vulture	<i>Gyps bengalensis</i>
23	Marsh Harrier	<i>Circus aeruginosus</i>
24	Short-toed Eagle	<i>Circaetus gallicus</i>
25	Shaheen Falcon	<i>Falco peregrinus peregrinator</i>
26	Kestral	<i>Falco tinnuculus</i>
27	Grey Partridge	<i>Perdix pondicerianus</i>
28	Bluebreasted Quail	<i>Coturnix chinensis</i>
29	Jungle Bush Quail	<i>Perdicula asiatica</i>
30	Red Junglefowl	<i>Gallus gallus</i>
31	Grey Junglefowl	<i>Gallus sonneratii</i>
32	Common Peafowl	<i>Pavo cristatus</i>
33	Moorhen	<i>Gallinula chloropus</i>
34	Purple Moorhen	<i>Porphyrio porphyrio</i>
35	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>
36	Bronzewinged Jacana	<i>Metopidius indicus</i>
37	Redwattled Lapwing	<i>Vanellus indicus</i>
38	Common Sandpiper	<i>Tringa hypoleucos</i>
39	Pintail Snipe	<i>Gallinago stenura</i>
40	Fantail Snipe	<i>Gallinago gallinago</i>
41	Little Stint	<i>Calidris minuta</i>

42	Coot	<i>Fulica atra</i>
43	Greyfronted Green Pigeon	<i>Treron pompadora</i>
44	Yellowlegged Green Pigeon	<i>Treron phoenicoptera</i>
45	Indian Ring Dove	<i>Streptopelia decaocto</i>
46	Spotted Dove	<i>Streptopelia chinensis</i>
47	Little Brown Dove	<i>Streptopelia senegalensis</i>
48	Alexandrine Parakeet	<i>Psittacula eupatria</i>
49	Roseringed Parakeet	<i>Psittacula krameri</i>
50	Blossomheaded Parakeet	<i>Psittacula cyanocephala</i>
51	Common Hawk-cuckoo	<i>Cuculus varius</i>
52	Koel	<i>Eudynamys scolopacea</i>
53	Jungle Owlet	<i>Glaucidium radiatum</i>
54	Spotted Owlet	<i>Athene brama</i>
55	Indian Jungle Nightjar	<i>Caprimulgus indicus</i>
56	Franklin's Nightjar	<i>Caprimulgus affinis</i>
57	House Swift	<i>Apus affinis</i>
58	Common Kingfisher	<i>Alcedo meninting</i>
59	Lesser Pied Kingfisher	<i>Ceryle Atthis</i>
60	Whitebreasted Kingfisher	<i>Halycon smyrnensis</i>
61	Green Bee-eater	<i>Merops orientalis</i>
62	Indian Roller	<i>Coracias benghalensis</i>
63	Hoopoe	<i>Upupa epops</i>
64	Common Grey Hornbill	<i>Tockus birostris</i>
65	Coppersmith	<i>Megalaima haemacepjala</i>
66	Lesser Goldenbacked Woodpecker	<i>Dinopium benghalense</i>
67	Indian Pitta	<i>Pitta brachyura</i>
68	Redwinged Bush Lark	<i>Mirafra erythroptera</i>
69	Ashycrowned Finch-lark	<i>Eremopterex grisea</i>
70	Rufoustailed Finch-lark	<i>Ammomanes phoenicurus</i>
71	Short-toed Lark	<i>Calandrella cinerea</i>
72	Crested Lark	<i>Galerida cristata</i>
73	Swallow	<i>Hirundo rustica</i>
74	Wiretailed Swallow	<i>Hirundo smithii</i>
75	Grey Shrike	<i>Lanius excubitor</i>
76	Baybacked Shrike	<i>Lanius vittatus</i>
77	Rufousbacked Shrike	<i>Lanius schach</i>
78	Golden oriole	<i>Oriolus oriolus</i>
79	Blackheaded Oriole	<i>Oriolus xanthornus</i>
80	Black Drongo	<i>Dicrurus adsimilis</i>
81	Pied Myna	<i>Sturnus contra</i>
82	Common Myna	<i>Acridotheres tristis</i>
83	Jungle Myna	<i>Acridotheres fuscus</i>
84	Indian Tree Pie	<i>Dendrocitta vagabunda</i>
85	Jungle Crow	<i>Corvus macrorhynchos</i>
86	House Crow	<i>Corvus splendens</i>
87	Blackheaded Cockoo-shrike	<i>Coracina melanoptera</i>
88	Small Minivet	<i>Pericrocotus cinnamomeus</i>
89	Common Iora	<i>Aegithina tiphia</i>
90	Goldfronted Chloropsis	<i>Chloropsis aurifrons</i>

91	Redvented Bulbul	<i>Pycnonotus cafer</i>
92	Spotted Babbler	<i>Pellorneum ruficeps</i>
93	Yelloweyed Babbler	<i>Chrysomma sinense</i>
94	Common Babbler	<i>Turdoides caudatus</i>
95	Jungle Babbler	<i>Turdoides striatus</i>
96	Large Grey Babbler	<i>Turdoides malcolmi</i>
97	Tickell's Blue Flycatcher	<i>Muscicapa tickelliae</i>
98	Verditer Flycatcher	<i>Muscicapa thalassina</i>
99	Whitebrowed Fantail Flycatcher	<i>Rhipidura aureola</i>
100	Paradise Flycatcher	<i>Terpsiphone paradisi</i>
101	Blacknaped Flycatcher	<i>Hypothymis azurea</i>
102	Streaked Fantail Warbler	<i>Cisticola juncidis</i>
103	Franklin's Wren-warbler	<i>Prinia hodgsonii</i>
104	Plain Wren-warbler	<i>Prinia subflava</i>
105	Ashy Wren-warbler	<i>Prinia socialis</i>
106	Magpie Robin	<i>Copsychus saularis</i>
107	Indian Robin	<i>Sexicoloides fulicata</i>
108	Black Redstart	<i>Phoenicurus phoenicurus</i>
109	Stone Chat	<i>Saxicola torquata</i>
110	Pied Bush Chat	<i>Saxicola caprata</i>
111	Grey Tit	<i>Parus major</i>
112	Paddyfield Pipit	<i>Anthus novaeseelandiae</i>
113	Grey Wagtail	<i>Motacilla cinerea</i>
114	Large Pied Wagtail	<i>Montacilla maderaspatensis</i>
115	Thiskbilled Flowerpecker	<i>Dicaeum agile</i>
116	Tickell's Flowerpecker	<i>Dicaeum erythrorhynchos</i>
117	Purple Sunbird	<i>Nectarinia asiatica</i>
118	Purplerumped Sunbird	<i>Nectarinia zeylonica</i>
119	White-eye	<i>Zosterops palpebrosa</i>
120	House Sparrow	<i>Passer domesticus</i>
121	Baya	<i>Ploceus philippinus</i>
122	Blackthroated Weaver Bird	<i>Ploceus benghalensis</i>
123	Red Munia	<i>Estrilda amandava</i>
124	Whitethroated Munia	<i>Lonchura malabarica</i>
125	Spotted Munia	<i>Lonchura punctulata</i>
126	Blackheaded Munia	<i>Lonchura malacca</i>

Appendix 2

Butterfly List

Sr. No	Common name	Scientific Name
1	Common Rose	<i>Pachiliopta aristolochiae</i>
2	Crimson Rose	<i>Pachiliopta hector</i>
3	Common Mime	<i>Chilasa clytia</i>
4	Lime Butterfly	<i>Papilio demoleus</i>
5	Common Mormon	<i>Papiloi polytes</i>
6	Tailed Jay	<i>Graphium agamemnon</i>
7	Common Jezebel	<i>Delias eucharis</i>

8	Psyche	Leptosia nina
9	Pioneer	Anaphaeis aurota
10	Common Gull	Cepora nerissa
11	White Orange Tip	Ixias Marianne
12	Yellow Orange Tip	Ixias pyrene
13	Common Wanderer	Pareronia valeria
14	Common Emigrant	Catopsilia Pomona
15	Mottled Emigrant	Catopsilia pyranthe
16	Common Grass Yellow	Eurema hecabe
17	Common Pierrot	Castalius rosimon
18	Zebra Blue	Syntarucus plinius
19	Pale Grass Blue	Zizeeria maha
20	Grass Jewel	Freyeria trochilus
21	Gram Blue	Euchrysops cnejus
22	Common Cerulean	Jamides celeno
23	Common Acacia Blue	Surendra quercetorum
24	Plum Judy	Liphyra brassolis
25	Plain Tiger	Danaus chrysippus
26	Striped Tiger	Danaus genutia
27	Blue Tiger	Tirumala limniace
28	Glassy Tiger	Parantica aglea
29	Common Crow	Euploea core
30	Common Evening Brown	Melanitis leda
31	Common Five Ring	Ypthima baldus
32	Leopard	Phalanta phalantha
33	Blue Pansy	Junonia orithya
34	Yellow Pansy	Junonia hierta
35	Lemon Pansy	Juninia lemonias
36	Chocolate Pansy	Precis iphita
37	Danaid Eggfly	Hypolimnas misippus
38	Great Eggfly	Hypolimnas bolina
39	Common Sailor	Neptis hylas
40	Common Sergeant	Athyma perius
41	Common Baron	Euthalia aconthea
42	Baronet	Symphaedra nais
43	Common Nawab	Polyusa athamas
44	Tawny Castor	Acraea terpsicore
45	Common Banded Owl	Hasora chromus