

KEEZHARKUTHU SMALL HEP (19.8 MW)

IDUKKI DISTRICT

NOTES ON

**THE REVISED PROPOSAL FOR FOREST CLEARANCE
UNDER FOREST CONSERVATION ACT 1980 (For
diversion of 2.42 ha initially & 0.98 ha finally) BASED ON
THE JOINT INSPECTION OF THE PROJECT SITES BY,**

- (1) FOREST DEPARTMENT**
- (2) POWER DEPARTMENT**
- (3) ENERGY MANAGEMENT CENTRE**
- (4) KERALA STATE ELECTRICITY BOARD**
- (5) AGRICULTURE & ECO – SYSTEMS MANAGEMENT CENTRE &**
- (6) KEEZHARKUTHU POWER PVT. LTD,**

ON 17.11.2018

NOVEMBER 2018

Notes on the Revised proposal for Forest Clearance based on the joint inspection held on 17.11.2018

1. Basis for the Joint Inspection

A Forest Clearance proposal, seeking diversion of 2.87 ha of forest land initially and 0.98 ha finally (as 1.89 ha of forest land is to be handed over back to Forest Department, after construction of the project) in the Thodupuzha Reserve Forest of Kothamangalam Division, was filed on 30.06.2018, duly incorporating the points discussed in the High Power Committee meeting held on 08.05.2018 & chaired by the Chief Secretary, Government of Kerala.

In the High Power Committee meeting, among other things, it was decided to have a joint inspection of the project sites regarding the Forest Clearance proposal by the Forest Dept. Energy Management Centre, KSEB and the Company. The Chief Conservator of Forests, Kottayam in letter dt. 26.10.2018 informed that the Joint inspection will be held on 17.11.2018.

Accordingly the joint inspection was held on 17.11.2018 and the following Officials / Members were present

I. MEMBERS PRESENT

Forest Department

1. Mr. Deepak Misra, I.F.S
Chief Conservator of Forests, Kottayam.
2. Mr. Unnikrishnan, I.F.S
Divisional Forest Officer, Kothamangalam.

Power Department

3. Mr. Gopakumaran Nair,
Joint Secretary to Govrnment

Energy Management Centre

4. Mr. M.K.Parameswaran Nair
Technical Committee Member of Kerala Govt. for SHP
5. Mr. G.Anil
Joint Director
6. Mr. Dineshkumar
Energy Technologist

Kerala State Electricity Board

7. Mr. Ajith
Executive Engineer

Keezharkuthu Power Private Limited

8. Mr. Onkar Singh
Managing director
9. Mr. Jasbir Singh
Joint Managing director
10. Dr. Shaji
Environmental Specialist,
Agriculture & Eco systems Management Centre, Trivandrum.

2. Background

Kerala once enjoyed a comfortable position with regard to availability of power, with the completion of major HEPs like Sabarigiri & Idudki in 1966. However, due to increase in demand and stalemates in capacity addition, power position in the State has become critical from 1985 onwards. Physiography of Kerala State, constraints in transportation of coal, environmental issues etc are not favourable for adding more thermal power stations. The situation, therefore, warrants implementation of more number of hydro projects.

3. Allotment of SHPs to private sector under BOOT basis.

Hydro projects upto 25MW has been classified as 'Small HEPs' by CEA and such schemes have been classified as "white industry" by the Ministry of Environment & Forests, Govt. of India which do not require environmental clearance from the State Pollution Control Board. Small hydro projects normally require minimum forest land only, for their implementation. With a view to enhance the installed capacity of the State, Govt. vide GO (MS) no. 23/2014/PD dt. 21.07.2014 allotted 25 SHPs to various private developers for development by them under BOOT basis.

Keezharkuthu Small HEP (19.8MW) is one among those 25 projects.

Also, recently Govt. of Kerala vide GO (MS) No. 25/2017/PD dated 11-12-17 have further allotted 20 projects to various developers.

4. Keezharkuthu Small HEP (19.8 MW)

Under Keezharkuthu Small HEP, it is proposed to utilise the flows of Keezhar (a tributary of Muvattupuzha) for power generation by construction of a small 5 m high weir, 1600 m long tunnel and a single penstock of 1400 m length and a small power house with a capacity of 19.8MW.

4.1 Approvals / Clearances

- TEFR approved by KSEB.
- Power Transmission route approved by KSEB.
- Irrigation Dept. clearance is in final stage.
- Udumbanoor Panchayat has accorded approval.
- Clearance from Tribal Welfare Dept. is in final stage, as there is no tribal in the area.
- IREDA, the funding agency has heady been apprised about the project and they are ready to finance the project.
- Forest Clearance is the only approval pending.

5. Forest Clearance

A proposal seeking diversion of 3.24Ha of R.F. land with over ground components like approach road to surge shaft, penstock, etc was submitted on 08/10/2015. The proposal was rejected in view of the following:

- i. The alignment of the road, Power Transmission line etc., are not fixed and could not be ascertained in the field properly.
- ii. Number of trees to be cut for the project is not mentioned.
- iii. Widening of existing road has to be done.
- iv. An Environmental Impact Assessment study of the area need to be done to tell about the overall expected environmental damage on the forest area.
- v. The proposal submitted by the company is vague.
- vi. Diverting an ecologically important landscape for a small scale hydro electric project cannot be considered worth implementing.

5.1 Formulation of Fresh Proposal

With a view to reduce the R.F land requirement and adopting mitigative measures, certain modifications were made to the project components (eventhough additional project cost is involved) and a fresh proposal was evolved as per the following:

- i. Deletion of the entire approach road to surge shaft.
- ii. Embedment of the penstock pipe below the ground and returning back the forest land after embedment, to ensure crossing of the wild animals, if any.
- iii. Handing over back of the full approach road (to weir site), once construction activity is over, for afforestation.
- iv. Shifting of both dumping yards outside R.F area.

- v. Handing over 2.87 Ha of private land, adjoining the R.F. land near Kaithapara, towards compensatory afforestation.

The fresh proposal duly incorporating the items mentioned above was filed online on 30.06.2018.

5.2 Details of fresh proposal

As per the fresh proposal already submitted, all the components were made underground viz., tunnel, penstock etc. and the power house is already in the private land (400m away from the Forest boundary).

The mud approach road to weir site (1000m long) was also proposed to be handed over back to Forest Dept. for afforestation, once construction activity is over. The penstock is being embedded below ground, the hill slope can be maintained as before and there will not be any obstruction to crossing of animals, if any.

Only the 5m high diversion weir (check dam) and the surge tank of 5m dia will remain within the RF area after the construction of the project.

Human presence within the RF area will not be required during the operation period of the plant.

6. Joint Inspection :

The fresh Forest clearance proposal filed on-line on 30.06.2018 was the basis for the Joint – Inspection

6.1 Deliberations of the Joint Inspection

(A) The Chief Project Manager, KPPL, explained about the Keezharkuthu Power Project components as well as the Forest clearance proposal, which are as follows :

a) Approach Road to Weir

The Team proceeded to Kaithapara Village which is adjacent to the Reserve Forest boundary and nearer to the proposed Keezharkuthu diversion weir.

The proposed approach road alignment (1000 m long) to the weir site which takes off from the Kaithapara Village was studied. The company explained that only a mud road will be formed to enable construction of the 5 m high weir and on completion of the weir, the entire mud road will be handed over back to Forest Department for afforestation.

b) Diversion Weir (5m height)

The location of the weir, its height (5m), submersible area (0.50 ha) etc. were explained. It was also clarified that bulk of the flows of the Keezhar river are experienced during the monsoon season only, when the waterfall will be prominent and the waterfall will continue during the entire monsoon seasons, since only about 56% of the total water flows will be diverted and utilised for power generation and the balance 44% of the flows will continue to pass thro the waterfall. As such, the impact on the waterfall due to the diversion of water for power production will only be minimum.

In order to facilitate discharging the environmental flows, during the summer months, a 1m dia discharge pipe has been proposed to be embedded in the body of the weir at its bed level itself i.e., 545 m, which will ensure free flow of water for the drinking purposes of animals. The no of trees coming under submersible area is 138 nos. Moreover, the weir is proposed as an ungated one, which facilitates free flow of water over the spillway crest, without requiring any staff for operation purposes.

c) Power Tunnel (1600 m long)

The entire reach of the power tunnel will be underground. As per rules, provision of 0.48 ha of forest land has been made for this. No disturbance to the forests will be caused in this reach, since the entire structure will be below the ground.

d) Surge tank and Working area

It was explained by the Company that surge tank is for regulating the water flow into penstock pipe for feeding the Power House. The diameter of the steel tank will be 5 m and an working area of 30 x 30 m nearby is required for construction purposes. Total RF land sought in this location is 0.27 ha, of which 0.17 ha will be handed over back to the Forest Department, once the construction work is over.

e) Penstock Pipe (1400 m long)

The total length of the penstock pipe will be 1400m. Of this only 1000m lie within RF area and the remaining 400m lie within private lands. The width of RF land sought is only 7 m.

Laying of penstock will be started from the PH end and completed at the Surge tank end. The single line penstock will be buried below the ground throughout its length in the forest area except for the steep rocky stretch near the surge tank. The buried portion will be refilled with earth and the prevailing natural ground slope will be maintained. Extensive tree planting with native species will be done and the entire land in the penstock stretch will be handed over back to the Forest Department.

As natural landscape is to be restored, animals can easily cross this reach. Also, there will not be any need for any person to enter into this reach i.e., inside the restored Forest area, once the Penstock laying work is completed.

f) Power House and Approach road to PH

The Power House site which is proposed on the left bank of the Keezhar river at GL 88 m and is about 400m downstream and away from the RF boundary. Already there is an existing mud road, in private lands, to gain access to the PH location.

In as much as the PH location is 400m away from the RF boundary, there will not be any disturbance to the forest.

g) Power Evacuation System

As per KSEB approval, the power generated is to be evacuated by means of a 9 km long 33 KV line from the PH to the Udumbanoor 110/33/11 KV Sub-station. This power line is to be run along the existing mud road, Panchayat road, PWD Road etc. As such, no diversion of forest land is involved in the power evacuation system of KSEB.

h) General Issues deliberated by the Company

i. Methodology of Construction/Muck disposal

Construction period will be 24 months only. The mud approach road to weir site will be formed first and a temporary dumping yard, in private land (i.e., outside RF) in Kaithapara village, will be created, for disposal of the tunnel muck. After disposal of the muck, the land will be reclaimed & used for construction of staff quarters.

Excavated earth, muck etc. arising from the PH construction, will be disposed off thro the temporary dumping yard to be formed in private land near the PH area. This temporary dumping yard near the Power House will also be reclaimed and utilised for construction of quarters for PH operation staff.

ii. Requirement of RF Lands

It was explained by the Company that the initial requirement of forest land for all the components lying with in the RF area will be 2.87 ha and that 1.89 ha of forest land will be handed over back to Forest Department, once construction works are over. Thus the net requirement of forest land will only be 0.98 ha.

iii. Compensatory afforestation

These company explained that they have identified 2.87 ha of non – forest land, adjoining the forest land, in Maniyathram village near Kaithapara. The cost of NPV, afforestation programme etc. will be borne by the company.

iv. Net increase of forest cover by 1.89 ha

Even though, 2.87 ha is the initial requirement of forest land, Forest cover will be established in an equivalent area of 2.87 ha of compensatory land.

As such, when 1.89 ha of Forest land is handed over back, the net forest cover will get increased by 1.89 ha, which is advantageous to the Forest Dept.

v. EIA Study by Agriculture & Eco System Management Centre (AGES), Trivandrum

Environmental Impact Assessment study has been carried out covering impacts during construction phase, physical environment, biological environment, impact on flora/fauna loss of bio – diversity, habitat loss, wild animal movement, impact during operation phase etc.

In the Summary & Conclusion of the EIA Report it is stated that this project can be showcased as a ‘model’ for sustainable development and also that the project deserves favourable consideration for implementation by the Regulatory Authorities of Kerala.

vi. Prevention of trespassing during construction / Operation Phase

The company assured that during the construction phase of the project, check posts will be put up at the entry points of the approach roads both at the weir as well as PH sites and round the clock security will be placed in position to ensure total prevention of trespassing into the RF areas. This will be monitored by the company at its own cost.

vii. Request of the local people to the Honourable Chief Minister

All the people residing in the nearby area are in favour of this project and they are looking for employment opportunities as well as socio-economic development. As a matter of fact, they have submitted a Memorandum in this regard to the Honourable Chief Minister of Kerala.

(B) Need for implementation of this 19.8 MW Project

The Technical Committee Member of Kerala Govt. for SHP & The Joint Director / EMC informed that according to the Notification of Government of India, SHP projects upto 25 MW capacity are considered as ‘White Industry’ which do not even need Envl. Clearance from the State Pollution Control Board.

As such, they emphasised the need for implementing this 19.8 MW project, considering its benefits and involvement of least forest lands, so as to have capacity addition in the State. Moreover, this project is one of the projects shortlisted by the Government and approved by the Committee of the Government in which Officials from Forest, Power, Water Resources, Revenue, KSEB, EMC etc., are Members. Further, the Project will come back to Government after the BOOT period of 30 years.

Hence they reiterated that the proposal for forest clearance may be considered for recommending to Govt.

(C) Comments of the Chief Conservator of Forests, Kottayam

During the site study, the Chief Conservator of Forests, High Range Circle, Kottayam expressed apprehensions about the proposed approach road to the weir site for a length of 1000 m through the RF area.

To this, it was informed on the part of the Company that the entire RF land that may be diverted for this approach road will be handed over back to Forest Department for afforestation once the construction works are over. However the CCF was not convinced of the above.

Also, the CCF wanted the Company to give an assurance in writing that no major repair work will be done on the existing Kottakavala –Kaithapara Mud Road.

(D) Acceptance of the company

In view of the apprehensions of the Forest Department, the company informed that the approach road to the weir site can be deleted by substituting a temporary **Ropeway** with steel towers at required interval which will not require any diversion of RF Land but will require only permission for right of way from the Forest Dept.

(E) Consensus

1. The Company has agreed NOT to carry out any major repair work to the existing Kottakavala – Kaithapara mud road.
2. The proposed approach road to weir site will scrapped and substituted by a rope way temporarily during construction period.
3. The CCF informed that the proposal may be recast by deleting the approach road and incorporating the rope way.
4. The CCF agreed to examine the proposal if it is revised on the above lines.

7. Revised Proposal

Closely following the views of the CCF / High Range Circle, Kottayam, the proposal has now been revised as below:

- (i) The entire approach road to the weir site is scrapped
- (ii) In order to approach the weir site for construction of weir / removal of muck from power tunnel, a temporary “**ropeway**” with steel towers at required intervals (which will not require any diversion of forest land but will require only permission for ‘Right of way’, as is being granted for erection of power transmission lines) has been proposed now.
The steel towers which will be erected with bolts & nuts, will be removed once the construction works are over.

7.1 Number of trees to be cut

While carrying out the survey and investigation works, details of the trees that may have to be cut (species wise and girth wise) have been carefully accounted for.

The total number of trees required to be cut is 285.

Details of Tree cutting involved within the forest land proposed to be diverted (2.42 ha) are as below:

Sl. No.	Description	Tree cutting (of various girths)
(1)	(2)	(3)
1	Weir Site (including submergence)	138 Nos
2	Surge Shaft Site	32 Nos
3	Penstock Route	115 Nos
	Total	285 Nos

Note : Details of the girth of the various trees involved are furnished in the EIA Report

- 7.2 As per the revised proposal, the initial requirement of forest land will be 2.42 ha and the requirement after construction of the project will only be 0.98 Ha.

Three drawings showing,

- (i) General Arrangement of the Project
- (ii) Component wise requirement of RF land, land proposed for compensatory afforestation etc.
- (iii) Working area / Dumping yards outside R.F. etc. are also appended.

In sum, submergence of 0.5 Ha for 5m high diversion weir and the surge tank of 5 m dia alone will remain within the R.F. area, after the implementation of the project.

- 7.3 Statements showing the details of the component – wise requirement of forest land, R.F. Land proposed to be handed over back after construction are also attached hereto.

8. Merits of the revised Keezharkuthu Project (19.8 MW)

- (i) Only 2.42 ha. of forest land is required initially for implementing this 19.8 MW project.
- (ii) Out of this, 1.44 ha. i.e, 66% of the forest land will be handed over back to the Forest Dept. immediately once the construction is over and net requirement will only be 0.98 ha.
- (iii) Equal area of 2.42 ha. of private lands adjoining the forest boundary is to be handed over by the Company for compensatory afforestation.
- (iv) As such, there will be a net increase of 1.44 ha of Forest cover.
- (v) Requirement of forest land per MW of installed capacity will be only be 0.12 ha. initially and finally 0.05 ha. only.
- (vi) All the comments/issues raised by Forest Dept. have been fully addressed, in the revised forest clearance proposal.
- (vii) The PH & a portion of penstock are located in private land.
- (viii) Demand of power keeps on increasing in Kerala and the State do not have much scope for additional thermal power generation.
- (ix) In such a situation, the best option will be to go in for the cheap, renewable & eco-friendly hydro power projects, where the requirement of forest land will be minimum.
- (x) The project already has roads up to the power house area.
- (xi) People are residing near the project area and the company has received almost all other major clearances. They have also done the Environmental Impact Assessment (EIA) Study, even though it is not mandatory for small hydro projects, as required by the Forest Dept. It is very clear from the Report that the environmental damages in the forest area are very less when compared to benefits. They have also proposed a complete Environmental Management Plan (EMP) to build this small hydro project. Project proponent will not have any permanent human presence in the forest area once the construction is over. Only the submergence of weir (0.5 Ha) and the surge shaft (5m dia) will be left behind within the forest area.

9. Power situation in Kerala

Installed capacity of Kerala state as on 31.03.2016 is as follows:

Sl No	Description	Installed Capacity (in MW)	Capacity addition during 2015-16 (in MW)	% of increase
1	Hydro	2104	22	1 %
2	Thermal	719	-	0%
3	Wind	43	8.4	20%
4	Solar	14	14	100%
	Total	2880 MW	44.4MW	

As may be seen from the above, the capacity addition during 2015-16, is only 1%.

During the recent floods in Kerala during July/August 2018, extensive damage has been caused and some of the hydro power stations are also affected. This has resulted in acute shortage of electricity in Kerala. To meet out the demand, it is understood that KSEB is planning to float tenders for purchase of about 750MW of power.

Under the circumstances, there is urgent need to go in for more number of hydro power projects by Kerala.

10) Advantages of hydro power over other sources of Energy

- Hydro Power is a cheap, renewable, non-polluting and environmentally benign source of energy.
- Has the inherent ability for instantaneous starting, stopping, handling load variations and help in improving the reliabilities of power system.
- They have long useful life periods extending over 50 years and help in conserving the fossil fuel sources.
- They also help in opening avenues for development of remote & backward areas.
- They are also help in emission reduction of Co₂ which otherwise will emanate from thermal stations.
- In view of the forgoing, recently thrust has been given by Govt. of India as well as Kerala Govt. for prioritizing development of hydro renewable sources of energy.

11. Summary

The Developer (on BOOT basis) was invited by the Kerala State Govt. to develop this project, based on the decisions taken by High Power Committee of Kerala Govt.

As such, the fresh forest clearance proposal for Keezharkuthu (2.42ha initially & 0.98 ha finally) may be considered to be recommended by the State Forest Dept to the Ministry of Environment & Forest Govt. of India in the light of the following:

- (i) Allotment is made as per the policy decision of the Kerala state Govt.
- (ii) Developer has spent about Rs. 8 Crore so far, including premium amount of about Rs 6 crore paid to the state Govt.
- (iii) Requirement of 2.42 ha initially and finally 0.98 ha of forest land. The final requirement works out to only 0.05 ha/MW which is the barest minimum.
- (iv) All other clearances are in position
- (v) 2.42 Ha of Non forest land is being given adjoining the forest land in Kaithapara village or any other land as may be suggested by the forest dept, towards compensating afforestation.
- (vi) Net increase of forest cover to an extent of 1.44 Ha, as 1.44 Ha (out of 2.42 ha) will be surrendered back to Forest Dept after Construction.
- (vii) No human presence inside the Rf area or disturbance to forest land once construction is over.
- (viii) Discharge pipe of 1 meter dia has been provided at river bed level in the body of the weir to maintain the environmental flows.
- (ix) Waterfall will not be affected as 44% of the flows will continue to pass through the waterfall.
- (x) No irrigation is getting affected due to this project as recommended by the Irrigation Dept.
- (xi) In view of embedment of penstock pipe, crossing of animals, if any, will not be a problem.
- (xii) All the people residing nearby are favoring the project and they are looking for employment opportunities as well as social economical development
- (xiii) Rejection of such minimum forest land requirement proposal would mislead the other developers of the 25 projects allotted in 2014 and 20 more projects allotted recently in Dec 2017.
- (xiv) Kerala needs Hydro capacity addition to meet the day to day increase in demand as development of thermal stations is difficult & polluting.

- (xv) **In the Summary and Conclusion of the EIA Report, it is concluded that this project can be showcased as a model for sustainable development and also that the project deserves favorable consideration by the Regulatory Authorities of Kerala for implementation.**

12. Request

Considering the numerous benefits arising due to the implementation of the Keezharkuthu HEP (19.8MW), it is requested that the forest clearance proposal for diversion of 2.42ha of forest land initially & 0.98 ha finally, may kindly be recommended to the Ministry of Environment & Forest, Government of India.