



सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)



Minutes of 16TH MEETING OF THE EXPERT APPRAISAL COMMITTEE ON
meeting River Valley and Hydroelectric Projects held from 27/09/2024 to 27/09/2024 Date: 03/10/2024

4

MoM ID: EC/MOM/EAC/333794/9/2024
Agenda ID: EC/AGENDA/EAC/333794/9/2024
Meeting Venue: N/A
Meeting Mode: Virtual
Date & Time:

27/09/2024	10:30 AM	05:30 PM
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1. Opening remarks

The 16th meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 15th EAC meeting on 13th September, 2024 were confirmed.

3. Details of proposals considered by the committee

Day 1 -27/09/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Warasgaon Warangi Pumped Storage Project (1200 MW) by ADANI GREEN ENERGY LIMITED located at PUNE, MAHARASHTRA			
Proposal For		Amendment in ToR	
Proposal No	File No	Submission Date	Activity (Schedule Item)
IA/MH/RIV/496304/2024	J-12011/19/2022-IA.I (R)	19/09/2024	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

16.1.1: The proposal is for grant of Amendment in Terms of Reference (ToR) to the project for Warsgaon Warangi Pumped Storage Project (1500 MW) in an area of 225.14Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited

16.1.2: The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

S. No.	Para of ToR issued by MoE F&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1.	Subject	Warsgaon Warangi Pumped Storage Project of capacity 1200 MW at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited -Terms of Reference (TOR)	Warsgaon Warangi Pumped Storage Project of capacity 1500 MW at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited -Terms of Reference (TOR)	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2 x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases.
2.	Para 2	The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.	The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Warsgaon Warangi Pumped Storage Project of capacity 1500 MW in an area of 225.14 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.	The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
3.	Para 5 (i)	The proposed project Warsgaon Warangi Pumped Storage Project ("Project") is an Off-River PSP scheme with an installed capacity of 1200 MW (5 x 240 MW) with both upper and lower reservoirs	The proposed project Warsgaon Warangi Pumped Storage Project ("Project") is an Off-River PSP scheme with an installed capacity of 1500 MW (4x300 + 2x150) with both upper and lower reservoirs located across	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2 x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.6

S. No.	Para of ToR issued by MoE F&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		<p>located across minor nallahs in their initial reaches, wherein the flows are only seasonal during monsoon. The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad Districts.</p>	<p>minor nallahs in their initial reaches, wherein the flows are only seasonal during monsoon. The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad Districts.</p>	<p>5 Mm³, hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.</p>
4.	Para 5 (ii)	<p>The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18° 18' 20.3" N and longitude 73° 27' 47.42" E. The lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18° 16' 16.79" N and longitude 73° 27' 57.93" E.</p>	<p>The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18°18'44.3374" N and longitude 73°28'8.8284" E. The lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18°16'7.2444" N and longitude 73°27' 50.3928" E.</p>	<p>Change in location of upper reservoir which results in changes in Geographical latitude 18° 18' 44.3374" N and longitude 73° 28' 8.8284" E</p>
2.	Para 5 (iii)	<p>Upper dam is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River. Panshet Dam is located about 50 km south-west of Pune city in western India. Both Ambi and Mutha river originate from the Western Ghats and flow eastward until</p>	<p>Upper dam is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River. Panshet Dam is located about 50 km south-west of Pune city in western India. Both Ambi and Mutha river originate from the Western Ghats and flow eastward until it merges with the Mula River n</p>	<p>No Change</p>

S. No.	Para of ToR issued by MoE F&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		it merges with the Mula River near Pune city. After merging with the Mula river, it is called as Mula-Mutha River which further joins the Bhima River. The Bhima River is a major river in Western India and South India.	ear Pune city. After merging with the Mula river, it is called as Mula-Mutha River which further joins the Bhima River. The Bhima River is a major river in Western India and South India.	
3.	Para 5 (iv)	Lower dam is proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River. The Kal River is one of the West Flowing Rivers in Maharashtra. Kal river is a major tributary of Savitri River. The project area is in the Sahyadri ranges of the Western Ghats	Lower dam is proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River. The Kal River is one of the West Flowing Rivers in Maharashtra. Kal river is a major tributary of Savitri River. The project area is in the Sahyadri ranges of the Western Ghats	No Change
4.	Para 5 (v)	Land requirement: The total land required for the project components and related works has been estimated to be about 169 ha out of which 24.50 ha is forest land and 144.50 ha is non forest/private land.	Land requirement: The total land required for the project components and related works has been estimated to be about 225.14ha out of which 88.98ha is forest land and 136.16ha is non forest/private land.	The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
5.	Para 5 (vi)	The cost of the project is Rs. 4872 Crore at 2022-23 price level including Interest During Construction (IDC) of Rs. 528 Crore. As a preliminary estimate, a construction period of 5 years (60 months) fr	The cost of the project is Rs. 5516.8 Crore at 2023-24 price level including Interest During Construction (IDC) of Rs. 493 Crore. As a preliminary estimate, a construction period of 5 years (60 months) from the date of a	The project cost is increased from INR 4872 Crore to INR 5516.8 Crore is due to an increase of the project capacity, machineries, equipment's etc.

S. No.	Para of ToR issued by MoE F&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		om the date of award of civil works package has been estimated for this project.	ward of civil works package has been estimated for this project.	
6.	Para 5 (vii)	Proposed project is located about 9.2 km away from boundary of Tamhini Wildlife Sanctuary. The final notification for ESZ of Tamhini Wildlife Sanctuary published by MOEF vide notification dated 25 th February, 2021 and proposed project is located about 6.6 km away from final ESZ boundary of Tamhini Wildlife Sanctuary.	Proposed project is located about 9.2 km away from boundary of Tamhini Wildlife Sanctuary. The final notification for ESZ of Tamhini Wildlife Sanctuary published by MOEF vide notification dated 25 th February, 2021 and proposed project is located about 6.6 km away from final ESZ boundary of Tamhini Wildlife Sanctuary.	No Change
7.	Para 5 (ix) (a)	Warasgaon Warangi PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about seven (7) hours.	Warasgaon Warangi PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about 6.41 hours.	The same is dependent on volume of water availability in the reservoir, energy output requirement of the project etc. which is in turn dependent on techno economic analysis. Since the revised reservoir capacity is 7.65 Mm ³ & based on this reservoir capacity & energy output of 333 5.74 MU annually, we can generate for approximately 6.41 hours.
8.	Para 5 (ix) (b)	The energy output of the project with an installed capacity of 1200 MW has been estimated as 2913 MU annually.	The energy output of the project with an installed capacity of 1500 MW has been estimated as 333 5.74 MU annually.	Since there is change in the plant capacity from 1200 MW to 1500 MW & daily peaking requirement from 7 hours to 6.41 hours, therefore the energy output is also proportionately increased.
9	Para 6	Project capacity 1200	Project capacity 1500 M	The increase in project

S. No.	Para of ToR issued by MoE F&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		MW in an area of 169 MW	W in an area of 225.14 MW	capacity from 1200M W (5 X 240) to 1500MW (4x300 + 2 x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
10	Para 7	Project capacity 1200 MW in an area of 169 MW	Project capacity 1500 MW in an area of 225.14 MW	The increase in project capacity from 1200M W (5 X 240) to 1500MW (4x300 + 2 x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

16.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Amendment in Terms of Reference (ToR) to the project for Warsgaon Warangi Pumped Storage Project (1500 MW) in an area of 225.14Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

The Ministry granted Terms of Reference vide letter dated 13/02/2023 for the proposed project and PP has submitted the proposal for amendment in ToR for change in the capacity of the project and land area requirement alongside changes in design parameters as well.

The EAC noted that the proposed capacity has now been increased from 1200 MW to 1500 MW. The total land required for the project components and related works has been estimated to be about 225.14ha out of which 88.98ha is forest land and 136.16ha is non forest/private land.

It was observed that project site located in Western Ghats.

The upper & lower reservoirs are located on initial reaches of river course and located on small rivulets draining into the Ambi River and Kal River respectively. Catchment area of upper dam and lower dam are 7.4 sq. Km and 14.7 sq. km; annual yield works out to be 9.8 MCM and 19.47 MCM respectively. One time filling requirement is assessed as 13.1 MCM. The project proposes to use water of the catchment of lower reservoir for initial filling and annual recuperation of losses. This will impact several small rivulets draining into these reservoirs as the water will not be released downstream.

The EAC was of the view that PP has changed configuration of the project drastically which could attract more impact on the environment. The EAC raised its concerns about change in the total forest land required for the project with increase of more than three times i.e. from 24.50 Ha to 88.98 Ha. The EAC also noted that the PP has not applied for Stage-I forest clearance as per time period given as per OM dated 01.08.2013, which stipulates for submission of application for Stage-I Forest Clearance within 6 months of grant of TOR.

Accordingly, the EAC suggested the PP to submit a fresh proposal for grant of TOR with modified PFR incorporating information on:

The proposal was **returned** on the above lines.

3.1.5. Recommendation of EAC

Returned in present form

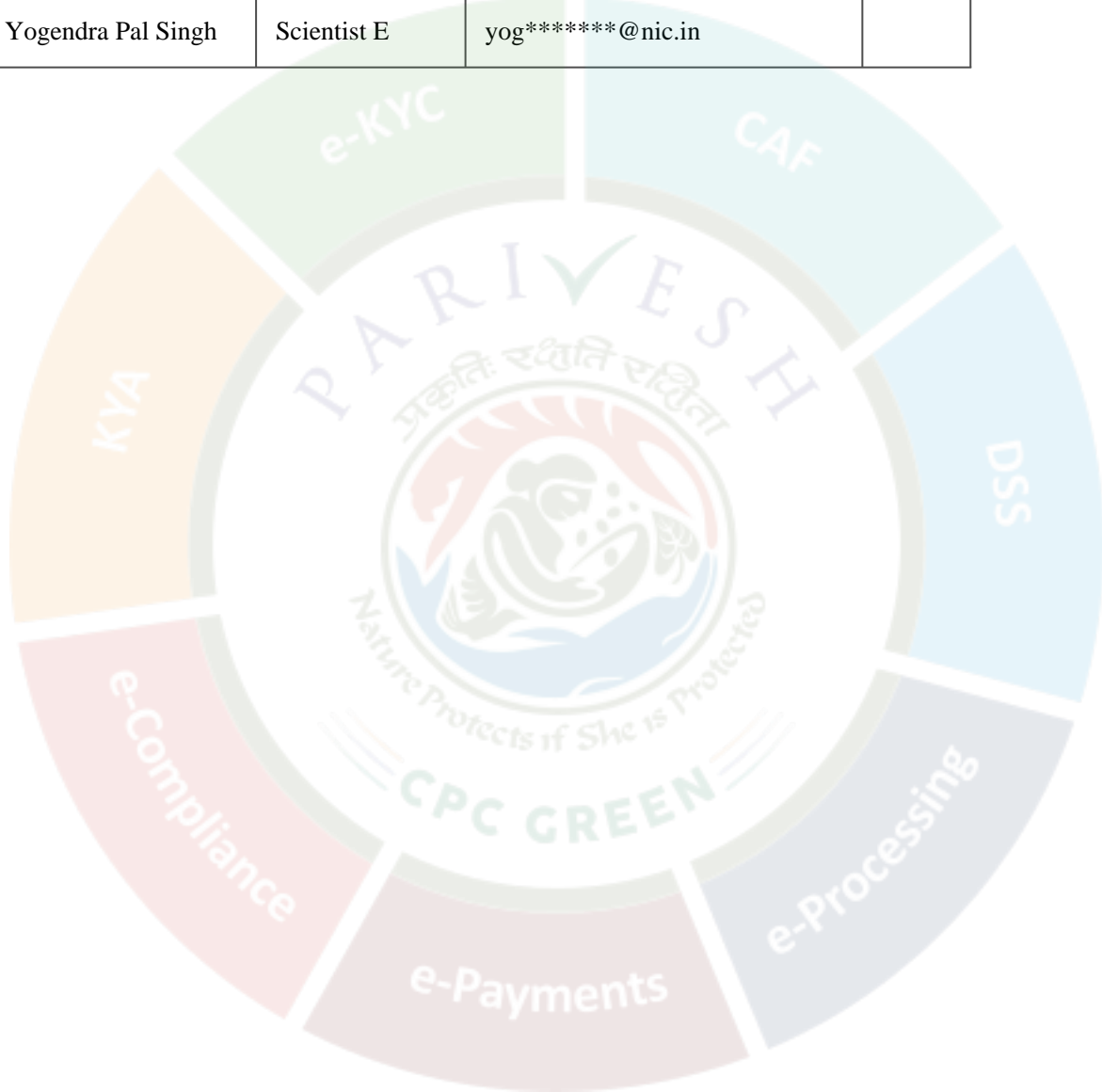
4. Any Other Item(s)

N/A

5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof G J Chakrapani	Chairman, EAC	cha*****@gmail.com	
2	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	
3	Dr Uday Kumar R Y	Member (EAC)	uda*****@yahoo.com	
4	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	

5	Dr J V Tyagi	Member (EAC)	jvt*****@gmail.com	
6	Shri Kartik Sapre	Member (EAC)	kar*****@gmail.com	
7	Shri Ajay Kumar Lal	Member (EAC)	akl*****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami*****@gmail.com	
9	Shri Piyush Ranjan	Member	emo*****@nic.in	
10	Shri Rajeev Varshney	Member	rva*****@gov.in	
11	Yogendra Pal Singh	Scientist E	yog*****@nic.in	



MINUTES OF THE 16TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH SEPTEMBER, 2024 THROUGH VIDEO CONFERENCE (ONLINE)

The 16th meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure I**.

Confirmation of the Minutes of the 15th EAC meeting:

The Minutes of the Meeting held on 15th EAC meeting on 13th September, 2024 were confirmed.

Correction in the Minutes of the 14th EAC meeting:

The Member Secretary informed to the EAC that an agenda item (no 14.8) was deliberated in the 14th EAC meeting held during 30.08.2024 to 31.08.2024 related to the proposal [vide Proposal No. IA/CG/RIV/490945/2024] for grant of Terms of References (TOR) for construction of Dangari Pumped Storage Hydro-electric Project (1400 MW) in an area of 499 ha in village Dangari, Madia and Rajpuri R F, Sub District Bagicha, District Jashpur, Chhattisgarh by M/s Chhattisgarh State Power Generation Company Limited. The EAC recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of aforesaid project.

The total land requirement as mentioned in the PFR and as informed during the meeting is 401.74 ha (80.03 ha Forest land + 321.71 ha non-forest land), the same has been confirmed by the PP vide ADS reply dated 30/09/2024. However, in the title of the proposal and in the para 14.8.1, sub para i. of 14.8.2, para 14.8.3 and para 14.8.4 of the agenda item no. 14.8 the land requirement got mentioned as 499 ha.

Accordingly, after verifying the records and information submitted by the PP, the EAC agreed to correct the minutes and recommended that the total land requirement of the project may be read as 401.74 ha (80.03 ha Forest land + 321.71 ha non-forest land).

Agenda Item No. 16.1

Warsgaon Warangi Pumped Storage Project (1500 MW) in an area of 225.14Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited – Amendment in Terms of Reference (TOR) - reg.

[Proposal No. IA/MH/RIV/496304/2024; F. No. J-12011/19/2022-IA.I (R)]

16.1.1: The proposal is for grant of Amendment in Terms of Reference (ToR) to the project for Warsgaon Warangi Pumped Storage Project (1500 MW) in an area of 225.14Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited

16.1.2: The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

- i. Warasgaon Warangi Pumped Storage Project of capacity 1500 MW at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra).
- ii. The Upper reservoir (new) is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River and lower reservoir (new) proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River.
- iii. The proposed Warasgaon Warangi is planned an Off-Stream Open Loop Pumped Storage Scheme. The live storage of upper reservoir is 7.65 and lower reservoir is 8.00 MCM.
- iv. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 13/02/2023 for the project Warsgaon Warangi Pumped Storage Project located at Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) in favour of M/s Adani Green Energy Limited.
- v. The project proponent has requested for amendment in the ToR with the details are as under:

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1.	Subject	Warsgaon Warangi Pumped Storage Project of capacity 1200 MW at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/ s Adani Green Energy Limited - Terms of Reference (TOR)	Warsgaon Warangi Pumped Storage Project of capacity 1500 MW at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/ s Adani Green Energy Limited -Terms of Reference (TOR)	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases.
2.	Para 2	The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Warsgaon Warangi Pumped	The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Warsgaon Warangi Pumped	The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations,

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.	Storage Project of capacity 1500 MW in an area of 225.14 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.	whereas earlier land details were based on the Preliminary feasibility.
3.	Para 5 (i)	The proposed project Warasgaon Warangi Pumped Storage Project ("Project") is an Off-River PSP scheme with an installed capacity of 1200 MW (5 x 240 MW) with both upper and lower reservoirs located across minor nallahs in their initial reaches, wherein the flows are only seasonal during monsoon. The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad Districts.	The proposed project Warasgaon Warangi Pumped Storage Project ("Project") is an Off-River PSP scheme with an installed capacity of 1500 MW (4x300 + 2x150) with both upper and lower reservoirs located across minor nallahs in their initial reaches, wherein the flows are only seasonal during monsoon. The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad Districts.	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
4.	Para 5 (ii)	The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18° 18' 20.3"	The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18°18'44.3374" N and	Change in location of upper reservoir which results in changes in Geographical latitude 18° 18' 44.3374" N and longitude 73° 28' 8.8284" E

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		N and longitude 73° 27' 47.42" E. The lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18° 16' 16.79" N and longitude 73° 27' 57.93" E.	longitude 73°28'8.8284" E. The lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18°16'7.2444" N and longitude 73°27' 50.3928" E.	
2.	Para 5 (iii)	Upper dam is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River. Panshet Dam is located about 50 km south-west of Pune city in western India. Both Ambi and Mutha river originate from the Western Ghats and flow eastward until it merges with the Mula River near Pune city. After merging with the Mula river, it is called as Mula-Mutha River which further joins the Bhima River. The Bhima River is a major river in Western India and South India.	Upper dam is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River. Panshet Dam is located about 50 km south-west of Pune city in western India. Both Ambi and Mutha river originate from the Western Ghats and flow eastward until it merges with the Mula River near Pune city. After merging with the Mula river, it is called as Mula-Mutha River which further joins the Bhima River. The Bhima River is a major river in Western India and South India.	No Change

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
3.	Para 5 (iv)	Lower dam is proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River. The Kal River is one of the West Flowing Rivers in Maharashtra. Kal river is a major tributary of Savitri River. The project area is in the Sahyadri ranges of the Western Ghats	Lower dam is proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River. The Kal River is one of the West Flowing Rivers in Maharashtra. Kal river is a major tributary of Savitri River. The project area is in the Sahyadri ranges of the Western Ghats	No Change
4.	Para 5 (v)	Land requirement: The total land required for the project components and related works has been estimated to be about 169 ha out of which 24.50 ha is forest land and 144.50 ha is non forest/private land.	Land requirement: The total land required for the project components and related works has been estimated to be about 225.14ha out of which 88.98ha is forest land and 136.16ha is non forest/private land.	The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
5.	Para 5 (vi)	The cost of the project is Rs. 4872 Crore at 2022-23 price level including Interest During Construction (IDC) of Rs. 528 Crore. As a preliminary estimate, a construction period of 5 years (60 months) from the date of award of civil works package has been estimated for this project.	The cost of the project is Rs. 5516.8 Crore at 2023-24 price level including Interest During Construction (IDC) of Rs. 493 Crore. As a preliminary estimate, a construction period of 5 years (60 months) from the date of award of civil works package has been estimated for this project.	The project cost is increased from INR 4872 Crore to INR 5516.8 Crore is due to an increase of the project capacity, machineries, equipment's etc.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
6.	Para 5 (vii)	Proposed project is located about 9.2 km away from boundary of Tamhini Wildlife Sanctuary. The final notification for ESZ of Tamhini Wildlife Sanctuary published by MOEF vide notification dated 25 th February, 2021 and proposed project is located about 6.6 km away from final ESZ boundary of Tamhini Wildlife Sanctuary.	Proposed project is located about 9.2 km away from boundary of Tamhini Wildlife Sanctuary. The final notification for ESZ of Tamhini Wildlife Sanctuary published by MOEF vide notification dated 25 th February, 2021 and proposed project is located about 6.6 km away from final ESZ boundary of Tamhini Wildlife Sanctuary.	No Change
7.	Para 5 (ix) (a)	Warasgaon Warangi PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about seven (7) hours.	Warasgaon Warangi PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about 6.41 hours.	The same is dependent on volume of water availability in the reservoir, energy output requirement of the project etc. which is in turn dependent on techno economic analysis. Since the revised reservoir capacity is 7.65 Mm ³ & based on this reservoir capacity & energy output of 3335.74 MU annually, we can generate for approximately 6.41 hours.
8.	Para 5 (ix) (b)	The energy output of the project with an installed capacity of 1200 MW has been estimated as 2913 MU annually.	The energy output of the project with an installed capacity of 1500 MW has been estimated as 3335.74 MU annually.	Since there is change in the plant capacity from 1200 MW to 1500 MW & daily peaking requirement from 7 hours to 6.41 hours, therefore the energy output is also proportionately increased.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
9	Para 6	Project capacity 1200 MW in an area of 169 MW	Project capacity 1500 MW in an area of 225.14 MW	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.
10	Para 7	Project capacity 1200 MW in an area of 169 MW	Project capacity 1500 MW in an area of 225.14 MW	The increase in project capacity from 1200MW (5 X 240) to 1500MW (4x300 + 2x150) is due to change in location of upper reservoir which results in increasing of live storage from 6.67 Mm ³ to 7.65 Mm ³ , hence project capacity increases. The land area has increased (168.95ha to 225.14ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
				on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility.

16.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Amendment in Terms of Reference (ToR) to the project for Warsgaon Warangi Pumped Storage Project (1500 MW) in an area of 225.14Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

The Ministry granted Terms of Reference vide letter dated 13/02/2023 for the proposed project and PP has submitted the proposal for amendment in ToR for change in the capacity of the project and land area requirement alongside changes in design parameters as well.

The EAC noted that the proposed capacity has now been increased from 1200 MW to 1500 MW. The total land required for the project components and related works has been estimated to be about 225.14ha out of which 88.98ha is forest land and 136.16ha is non forest/private land.

It was observed that project site located in Western Ghats.

The upper & lower reservoirs are located on initial reaches of river course and located on small rivulets draining into the Ambi River and Kal River respectively. Catchment area of upper dam and lower dam are 7.4 sq. Km and 14.7 sq. km; annual yield works out to be 9.8 MCM and 19.47 MCM respectively. One time filling requirement is assessed as 13.1 MCM. The project proposes to use water of the catchment of lower reservoir for initial filling and annual recuperation of losses. This will impact several small rivulets draining into these reservoirs as the water will not be released downstream.

The EAC was of the view that PP has changed configuration of the project drastically which could attract more impact on the environment. The EAC raised its concerns about change in the total forest land required for the project with increase of more than three times i.e. from 24.50 Ha to 88.98 Ha. The EAC also noted that the PP has not applied for Stage-I forest clearance as per time period given as per OM dated 01.08.2013, which stipulates for submission of application for Stage-I Forest Clearance within 6 months of grant of TOR.

Accordingly, the EAC suggested the PP to submit a fresh proposal for grant of TOR with modified PFR incorporating information on:

- i. Fresh alternative site analysis modifying the project layout with no obstruction of small rivulets in the area as the small rivulets are the key source of water for the perennial rivers in the western ghats.
- ii. Change in project profile i.e. change in project layout, change in forest land and private land requirement.

The proposal was *returned* on the above lines.

Agenda Item No. 16.2

Khairibhandan Barrage Project at village Anlabeni, Tehsil – Jashipurin, Mayurbhanj, Odisha by M/s Department of Water Resources, Government of Odisha –Reconsideration for Environmental Clearance (EC) - reg

[Proposal No. IA/OR/RIV/30160/2015; File No. J-12011/24/2015-IA-I (R)]

16.2.1: The proposal is for grant of Environmental Clearance (EC) for the project Khairibhandan Barrage Project at village Anlabeni, Tehsil – Jashipurin, Mayurbhanj, Odisha by M/s Department of Water Resources, Government of Odisha

16.2.2: The Project Proponent made a detailed presentation on the salient features of the project and informed that:

- i. Khairbandhan Barrage Project is contemplated on Khairibhandhan River. The project is located in Jashipur Block of Mayurbhanj District near village Anlabeni at Latitude of 21° 57' 59" N and Longitude of 86° 03' 32" E.
- ii. The barrage site is situated about 24.6 Kms (aerial distance) away from Karanjia Town. The nearest Railway Station is BadamPahar which is about 16.4 Kms from the proposed barrage site. The length of approach road connecting to the barrage site is only 2 Km. NH-6 (Nagpur –Kharagpur) at 1.37 km, SH-49 at 3 km from the project site .
- iii. The project envisages construction of a Barrage across Khairibhandan River at village Anlabani in Jashipur Block of Mayurbhraj Dist. with 100% intensity during Khariff. Since there is no other dependable sources of water to bring under command this chronically drought affected area, the tapping of water from Khairibhandan River is inevitable for uplifting the socio economic status of the local people. Most of the population belongs to scheduled tribe, scheduled cast and other weaker sections of the society who depends basically on agricultural income to sustain their lively hood. Hence, the project is essential for enhancing the living status of the local people.
- iv. The proposed project is a medium irrigation scheme which has the total culturable command area of 6950 hectares. As per the EIA notification, 2006 and its subsequent amendment, the

project is a “Category A” project along with applicability of the General Condition because the Similipal National park boundary is situated at 9.46 Km from the barrage site, the project was classified as “A” category.

- v. The total land area required for construction of proposed KhairiBandhan project involves submergence of about 430.814 ha of land which includes 26.444 Ha forest land , 101.115 Ha Revenue land and 303.255 Ha agricultural land.

16.2.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Environmental Clearance to the project for Khairibhandan Barrage Project at village Anlabeni, Tehsil – Jashipurin, Mayurbhanj, Odisha by M/s Department of Water Resources, Government of Odisha.
- The proposed project is a medium irrigation scheme which has the total culturable command area of 6950 hectares. As per the EIA notification, 2006 and its subsequent amendment, the project is a “Category A” project along with applicability of the General Condition because the Similipal National park boundary is situated at 9.46 Km from the barrage site, the project was classified as “A” category.
- The proposal for grant of Environmental Clearance was earlier considered by the EAC in its meeting held on 23.09.2019 and 2.12.2020. The EAC in its meeting held on 2.12.2020 recommended the proposal for grant of Environmental Clearance subject to submission of Stage-I FC.
- Accordingly, the Project Proponent has submitted the Stage-I FC for diversion of forest land of an area of 26.444 Ha granted by MoEF&CC vide letter dated 5-ORC419/2020-BHU dated 22.03.2021 on Parivesh portal on 11.09.2024 after the time limit as stipulated in the O.M. dated 18.05.2012 read with OM dated 19.06.2014 the proposal is being considered by the sectoral EAC in the present meeting.
- The EAC was of the view that initially baseline data collected for the EIA / EMP studies is June 2016-June 2017. The PP informed that no project activity has been started on site, so there is no considerable change . The was of the view that being a welfare project for irrigation in Mayurbhanj District which is a drought prone area, the collection of fresh one season baseline data can be exempted. Therefore, the EAC retreated its recommendations of earlier EAC meeting held on 27.09.2024 and recommend the proposal for grant of Environmental Clearance.

16.2.4 The EAC after examining the information submitted and detailed deliberations **recommended** the proposal for grant of Environmental Clearance by the Ministry to Khairibhandan Barrage Project at village Anlabeni, Tehsil – Jashipurin, Mayurbhanj, Odisha by M/s Department of Water Resources, Government of Odisha., under the provisions of EIA

Notification, 2006 and as amended with subject to compliance of applicable Standard EC conditions with the following additional conditions:

- i. The provision for fish pass shall be designed and incorporated in the project design in consultation with ICAR-CIFRI.
- ii. Other environmental safeguards conditions suggested by the EAC (RV&HEP) in its meeting held on 2/12/2020 shall remain unchanged.

16.3 Any other item with the permission of the Chairman

16.3.1 Site visit for Pumped storage project in Western Ghats -reg.

The EAC reviewed the Terms of Reference recommended to the PSPs proposed to be located in Western Ghats. The Member Secretary informed the Expert Appraisal Committee (EAC) that the Ministry has granted Terms of Reference (ToR) to approximately 15 projects in the Western Ghats. Given the region's high environmental sensitivity, the EAC, in previous meetings, recommended site visits by sub-committee members to several pumped storage projects.

These projects are located in the ecologically fragile Western Ghats and huge forest area is also involved, the EAC emphasized that, prior to granting environmental clearance or making any recommendations, all pumped storage projects in Western Ghats that have been granted ToR by the Ministry, a site visit shall be carried in toto wherever possible.

16.3.2 Discussion on the Report of the Site visit undertaken by EAC(Sub-Committee), River Valley & Hydro-electric during 10.06.2024 to 14.06.2024 for Phata Byung Hydro Electric Project (76 MW) in an area of 23.323 Ha, located at Village Barasu, Byung, Jamu, Gair etc., Sub District Okhimath, District Rudraprayag (Uttarakhand) by M/s Mandakini Jal Urja Private Limited.

The Member Secretary informed the EAC that:

1. The Ministry vide its letter dated 29.4.2024 issued a Terms of Reference (ToR) to Phata Byung Hydro Electric Project (76 MW) in an area of 23.323 Ha, located at Village Barasu, Byung, Jamu, Gair etc., Sub District Okhimath, District Rudraprayag (Uttarakhand) by M/s Mandakini Jal Urja Private Limited.
2. The Ministry while grant of ToR stipulated a point that “*The EAC shall conduct site visit before considering the proposal for grant Environmental Clearance.*” Therefore, based on ToR dated 29.04.2024 MoEFCC vide letter dated 14th May 2024 constituted a sub-committee comprising of the following members to carry out site inspection for assess the additional studies and environmental safeguards measures and Sub Committee of EAC members visited the site on 10.06.2024 to 14.06.2024:

1. Dr. Uday Kumar R. Y – Chairman
2. Dr. Amiya Kumar Sahoo - Member
3. Shri. Kartik Sapre - Member
4. Shri. Munna Kumar Shah - Member

3. The sub-committee after site visit made following recommendations:
- i. Vegetative cover and forests being prime issue due to their predominant presence, any decision on Environment Clearance will heavily hinge on the forest clearance (FC) and NBWL clearance.
 - ii. PP shall carried out fresh baseline study to confirm species diversity and any changes, including possible reduction due to increased human activity and pollution in the upper stretches in and around the proposed reservoir.
 - iii. Based on 2007 EIA / EMP study, since there are no endangered fish species found in this river stretch. However, there is a need to reassess the baseline and decision will be taken based on revised baseline report, while taking into consideration the technical and financial feasibility of the same in the project. Any examples of success in the Himalayas should be included in the assessment.
 - iv. PP shall ensure to release of E-flow release into the and prepare EIA/EMP as per the recommendations of CIA/CCS of upper reaches of ganga in Uttarakhand.
 - v. Strategy for potential reservoir fisheries and tributaries, taking into consideration present human disturbance and pollution, given the fact that the dam could block the flushing of waste and poor water quality need to be included in the study.
 - vi. Identify the criteria/targets for water quality and waste management before any reservoir fisheries program could be implemented.
 - vii. Potential hatcheries and any other mitigation to enhance the above-mentioned mitigation.
 - viii. Proper investigation on the migration rout and breeding/spawning habitat of trout/mahseer needs to be carried out.
 - ix. Possibilities on the fish migration/fish ways through the dam shall be explored.
 - x. Timeframe for the introduction of measures and targets, and monitoring linked to the construction and operations schedules.
 - xi. PP shall conduct study in consultation with government institution of repute such as CIFRI, to assess the impacts and formulate fish management plan in a time bound manner and recommendations to be implemented during preparation of EIA/EMP.
 - xii. Detailed study shall be carried out in terms of population to be effected during disaster such as caused in 2013, time to be taken to evacuate, plan shall be prepared for drill in every six months.
 - xiii. A fresh socio-cultural-economic study should be conducted with the help of local institutes/some reputed institute or to understand present scenario as compared to 2013.
 - xiv. Any design changes in the project details, PP shall obtain amendment in TOR, as there might be change in height of sluice gate, construction of embankments etc.
 - xv. PP shall carry out fresh seismic study and comparison shall be brought as compared to previous study carried.
 - xvi. PP shall carry out geological study for land use and land cover over the period of 13 years from the date of EC granted earlier.
 - xvii. Thoroughly checking the rework required like, cleaning, lining work, etc. in project and should be addressed with proper measures to ensure safety and efficacy.
 - xviii. M/s Mandakini Jal Urja Private Limited shall develop a mechanism to avoid any issues wrt to payment of salary/dues of workers/labourers including grievance addressal system at the site office.

- xix. Work towards control of erosion by implementing CAT plan shall be done to stop further landslides (if any) on the hill side of reservoir. The matter may be discussed with State Forest Department.
- xx. Project Proponent to approach State Government to remove damaged vehicles/equipment's immediately to further avoid the blockage in the stream.
- xxi. The project proponent shall develop certain infrastructure in support of State Government for segregation and disposal of solid waste and initiate awareness campaign during peak season.
- xxii. Forest Department shall earmark the afforestation and CAT plan implemented earlier and further list of activities in CAT shall be revised as per recommendation of EAC/granted ToR.
- xxiii. PP shall submit details of measures to be taken to ensure the safety of public during the period of pilgrimage while transporting the man, material and heavy equipment.

The EAC after detailed deliberations accepted the site visit report and suggested the PP to address the concerns raised by the Sub Committee in the EIA/EMP report.

The meeting ended with vote of thanks to the Chair.



ATTENDANCE

S. No.	Name of Member	Role	Remarks
1.	Prof. Govind Chakrapani	Chairman	P
2.	Dr. Uday Kumar R Y	Member	P
3.	DR. J. V. Tyagi	Member	P
4.	Dr. Mukesh Sharma	Member	P
5.	Shri Kartik Sapre	Member	P
6.	Shri Ajay Kumar Lal	Member	P
7.	Shri Rajeev Varshney	Member Representative of Central Electricity Authority (CEA)	P
8.	Shri Piyush Ranjan	Member Representative of Central Water Commission (CWC)	P
9.	Dr. J. A. Johnson	Member Representative of Wildlife Institute of India (WII)	P
10.	Dr. A.K. Sahoo	Member Representative of CIFRI	P
11.	Shri Yogendra Pal Singh	Member Secretary	P
12.	Dr. Krishnendu Mondal	Scientist 'D'	P

Site visit Report of EAC sub-committee held during 10.06.2024 to 14.06.2024 for Phata Byung Hydro Electric Project (76 MW) in an area of 23.323 Ha, located at Village Barasu, Byung, Jamu, Gair etc., Sub District Okhimath, District Rudraprayag (Uttarakhand) by M/s Mandakini Jal Urja Private Limited.

The Ministry vide its letter dated 29.4.2024 issued a Terms of Reference (ToR) to Phata Byung Hydro Electric Project (76 MW) in an area of 23.323 Ha, located at Village Barasu, Byung, Jamu, Gair etc., Sub District Okhimath, District Rudraprayag (Uttarakhand) by M/s Mandakini Jal Urja Private Limited. The Ministry while grant of ToR stipulated a point that “*The EAC shall conduct site visit before considering the proposal for grant Environmental Clearance.*”

Therefore, based on ToR dated 29.04.2024 MoEFCC vide letter dated 14th May 2024 constituted a sub-committee comprising of the following members to carry out site inspection for assess the additional studies and environmental safeguards measures.

1. Dr. Uday Kumar R. Y – Chairman
2. Dr. Amiya Kumar Sahoo - Member
3. Shri. Kartik Sapre - Member
4. Shri. Munna Kumar Shah - Member

Following officers from M/s Mandakini Jal Urja Pvt Ltd were present:

1. Shri. Sanjeev Mehra – Director (Government Affairs)
2. Shri. Andreas Wallschuss Raimund – Project Director
3. Shri. Stephen Sparkes - Sustainability Manager
4. Shri. Satish Chaturvedi – Senior Manager (Sustainability)

Apart from above listed members and participants from the Project proponent, following officials are also participated in this visit

- Dr Vipin Gupta Scientist-C - Regional Office- MoEFCC-Dehradun
- Mr. Abhimanyu – DFO Rudraprayag and DFO (In charge)- Kedarnath Wildlife Division

A. Introduction:

Mandakini Jal Urja Private Ltd (“MJUPL”), formerly known as Lanco Mandakini Hydro Energy Private Limited (“LMHEPL”) has proposed to develop 76 MW Phata Byung Hydro Electric Project in Uttarakhand on river Mandakini. It is run-of-the river scheme to harness hydropower potential of river Mandakini (a tributary of Alaknanda) in the state of Uttarakhand. The project is located near Guptkashi about 60km from district Headquarter, Rudraprayag and 230km from state Capital, Dehradun. It is the first hydro power project downstream of Kedarnath on the river Mandakini.

B. Project Overview:

The project envisages construction of concrete gravity dam of height 26m (from river bed) for diverting 23.96 cumecs silt laden water (design discharge including silt flushing discharge). The Design Flood of the dam spillway capacity is 1850 cumecs. An HRT of length 9.3km and of size 3.6m horseshoe shape is planned to draw design discharge of 20.8 cumecs. The Project is envisaged to generate 340MU annually. Water shall be released back into river through a 4.2m-d shaped and 355m long tail race tunnel (TRT). Due to heavy flooding in 2013 in Mandakini valley the project was severely impacted by the flash floods. Reservoir was filled up with RBM and boulders due to flood. Reservoir has to be cleared of muck to create live storage required for peaking.

Status of Project Components (as per project proponent):

Sr No	Project element	Status
1	Dam complex	Diversion Tunnel of 4m is constructed. Cofferdam is damaged and need to be constructed. Dam concreting is done upto riverbed
2	Intake & Intake tunnels	2 no. of intake tunnels of size 2.5m d shaped of length 151m & 171m tunnels are Complete
3	Desanding Chambers & Silt Flushing Tunnel	Desanding Chambers excavation is completed. Concreting upto hopper portion is completed. Excavation of SFT is completed and concreting of the same is to be done
4	Head Race Tunnel	Excavation of 3.6m dia and 9.328km long HRT is completed except small stretch of 30m balance to be excavated. Concreting of about 1350m long HRT portion is complete
5	Surge Shaft	Excavation of 6.3m diameter surge shaft is complete. Concrete lining of 25m ht is also done
6	Pressure Shaft	Total length of pressure shaft is about 1242m. Excavation of about 900m is complete. Installation of Steel liner of about 30m is also complete
7	Powerhouse	Excavation of Powerhouse is complete. Installation of draft tube was done. Various adits and tunnels in Powerhouse complex are also completed. About 30m length of Tail Race Tunnel is also remaining

C. Chronology of Events:

Sr No	Date	Event Description
1	18 th Feb 2008	Environment Clearance approval from MoEFCC
2	4 th Dec 2017	Application submitted to MoEFCC for extension of EC for a period of 5 years
3	15 th Feb 2018	MoEFCC granted extension for 3 years from 18 th Feb 2018 to 17 th Feb 2021
4	1 st April 2020	As per Central Govt notification in view of outbreak of Corona Virus (Covid-19) for the period of 1 year from 1 st April 2020 to 31 st Mar 2021 is not considered as validity in EC

5	31 st Jan 2022	Project proponent requested for extension of EC validity
6	16 th Feb 2022	Online application submitted on PARIVESH portal for extension of EC validity
7	23 rd Feb 2023	42 nd EAC meeting for River Valley Projects (RIV Projects)
8	16 th Mar 2023	RO Dehradun conducted the site visit
9	23 rd Mar 2023	NCLT approved Statkraft resolution plan for Lanco Mandakini Hydro Ltd
10	5 th Apr 2023	Submission of Monitoring report (CCR) by IRO-Dehradun
11	15 th June 2023	Statkraft formally acquired LMHEPL project
15	24 th Nov 2023	Project was discussed in 4 th and in 9 th EAC meeting
21	01 st April 2024	Issuance of Minutes of 9 th EAC meeting wherein the project was recommended for grant of Standard ToR for conducting EIA study with public consultation (written submission) without public hearing
23	29 th April 2024	ToR letter issuance by MoEFCC

D. EAC subcommittee visit from 10 – 14 June 2024

The subcommittee of the Environmental Appraisal Committee (EAC) embarked on a site visit from Dehradun to the project site on June 10, 2024. During their visit, they assessed various aspects related to the construction project.

- Before the start of field visit, the subcommittee attended an opening meeting organized by the project proponent wherein brief overview of the project was appraised and further visit plan was discussed.
- During the briefing, background of the project with its history of implementation was informed as noted above. Local issues were discussed wherein it was informed that payment of salaries/due of local people has not been provided by earlier project proponent. Also, employment and availability of Human Resource issues were discussed. Committee desired that current Project Proponent and State Government jointly discuss and conclude the previous financial issues and others. Further, sub-committee opined that M/s Mandakini Jal Urja Private Limited shall develop a mechanism to avoid any issues wrt to payment of salary/dues of workers/labourers including grievance addressal system at the site office.
- It was discussed that the timing and duration for construction of dam has to be bring into line with the period of char dham yatra since huge influx of public/pilgrim is there in the valley. There may be issue of availability of manpower and safety issues while transporting the man, material and heavy equipment.
- The proposed project site is an undulating, rugged terrain with thin top soil and rocky surface beneath. The village of phata is in the valley of the mountain. It was observed that PP have to explore the different avenues for transporting heavy machineries in this mountainous terrain required for construction.
- No source of air pollution such as manufacturing industries, brick kiln etc were observed in the project area. The potential source may be due to impact of transportation and dust re-entrainment due to vehicular movement, wood combustion used for cooking otherwise there is no major source of air pollution.
- The air quality was observed to be good, however due to peak season of Kedarnath yatra, vehicular emissions and unpaved road dust was present.

- It was communicated by PP that about 5-10 mts of river bed has been filed by rocks/boulders after 2013 flood which is required to be removed for achieve the designed reservoir level. It was proposed that these mined out material shall be stored near the bank of river and the current bus stop shall be elevated by using this material. Further proper compaction and embankment shall be constructed to strength the river bank to avoid any sliding in the river bed.
- Traffic has increase gradually, especially during yatra period and road does not seem to be meant for such load, vibration and vehicular movement.
- At the proposed reservoir, currently bus stop is operation on one side and other side there is mountain. It was desired by the sub-committee that the work towards control of erosion by implementing CAT plan shall be done to stop further land slides (if any).
- **Dam Site Inspection:** The subcommittee visited the dam site, exploring downstream areas, including the dam top tunnel and the silt flushing tunnel. They also inspected part of ADIT-1.
- Foundation upto the riverbed has been constructed and naked steel rods out of the concrete foundation can be seen.
- It was also observed that many damaged vehicles/equipment are lying in the river/stream currently. It was informed that these are property of earlier contractor who were involved and had been left during floods and same has not been removed since then. It was advised to project proponent to approach State Government to remove this immediately to further avoid the blockage in the stream. The oil/diesel/grease and the rusted material may pollute the water.
- **Upstream Area Visit:** The committee observed the reservoir area and noted the accumulation of spoils and muck upstream of the dam. Sanitation facilities were found to be inadequate due to the high anthropogenic pressure from the Kedarnath Yatra. Sewage from nearby hotels was also flowing into the Mandakini River through a local stream situated approximately 500 to 600 meters upstream from the dam.
- It was observed that coffer dam constructed for diverting the water through tunnel by earlier project proponent was broken after 2013 Kedarnath flood and need to be reconstructed.
- It was observed the Solid Waste Management during the Kedarnath Yatra season is one the major problem and has to be properly managed by the State Government. The project proponent shall develop certain infrastructure in support of state government for segregation and disposal of solid waste.
- It was observed that there has been encroachment, and some part of upper area has been utilised by local administration/state government, which PP need to discuss and get it sorted. Thus, muck disposal locations also need to be reviewed.
- **Upper Catchment Area Exploration:** The subcommittee flew by helicopter to the Kedarnath Shrine area. They witnessed glaciers and gained insights into the causes and impacts of the 2013 Kedarnath disaster flood. The project proponent and Forest Department officials briefed them on mitigation measures.
- Aerial view was captured on the way of visit to Kedarnath valley. It consists of dense forest and may streamlets emerging from the mountain peaks and meeting the mandakini river.
- **Glacial Lake Outburst Floods (GLOFs)**

- During the Upper catchment area Project Proponent has also informed subcommittee members that the project dam site is situated in close proximity to snowbound regions and glacial lakes near Kedarnath, Uttarakhand, rendering it highly susceptible to the impacts of Glacial Lake Outburst Floods (GLOFs). A total of 24 glacial lakes have been identified in the vicinity of the project site, with 6 of these lakes classified as critical due to their potential to trigger floods. Notably, the most critical lake, having volume (0.92 MCM), is located just 16 kilometers upstream of the dam, amplifying the risk of GLOF events impacting the project.
- In-depth GLOF studies have been conducted to assess the potential risks and impacts. It has been determined that the GLOF event could generate a peak discharge of 661 cumec at the dam site, with a short travel time of approximately 20 minutes.
- **Early Warning System:** The project proponent informed the committee about the installation of an Early Warning System in the Rambara area with respect to this part of catchment area to address emergency events beyond the Uttarakhand government's existing mitigation measures.
- Further, it was informed the committee that Early warning systems are being planned on two tributaries i.e. Vasuki Ganga and Mandakini about 10 km u/s of the dam axis. These systems often involve monitoring weather patterns, and other relevant environmental factors to provide timely alerts to downstream communities. In Phata Byung HEP, EWS installation is planned to be done in the following locations
 - Triyugi Narayan on Vasuki ganga - Gauge, Automatic Water Level Sensor (AWLS) & velocity sensor about 10 km u/s of Dam Axis (Proposed)
 - Near Rambara on Mandakini - Gauge, AWLS Sensor and Velocity sensors about 15 km u/s of Dam Axis (Proposed)
 - Dam Axis –Gauge & Discharge, AWLS and Hooters (Proposed)
 - Hooter at TRT outfall and other identified locations
 - Communication system-10 GSM sim and one LED display at dam.
 - Solar Pannel with 14-day battery backup
- **Powerhouse Site Visit:** The subcommittee inspected the powerhouse site, examining site components and the storage facility.
- It was observed that most of tunnel work has been completed except some stretch in between and at the end from power house to TRT exit in River. During the visit, seepage in tunnel were seen which needs to be rectified. Area of power house was also visited and it was observed the cleaning of underground portion of power house was being done.
- It was also observed that due to waterlogging the naked steel were rusted and some rework is required, like proper cleaning, derusting, etc. need to be done.
- The matter regarding earlier compliance of EC conditions wherein implementation of CAT plan, afforestation was discussed with DFO. It was desired that Forest Department shall earmark the afforestation and CAT plan implemented earlier and further list of activities in CAT shall be revised as per recommendation of EAC/granted ToR.

- **Revised CAT Plan:** The committee desired that the DFO shall prepare a revised CAT plan as per ToR condition and seek his view and status which includes detail reviewing the catchment area and impact on this post 2013 disaster. DFO has informed committee that he got the letter from APCCF- Planning (forest department – Uttarakhand) regarding preparation of the CAT plan with the help of consultants and in this regard in coordination with Project Proponent he is in the process of preparation of revised CAT Plan.
- **Land Encroachment Issue:** The project proponent raised concerns about land encroachment by local authorities and residents. They have written to the district authorities seeking resolution. The Committee noted this point and informed Project proponent that in case of requirement Govt. of Uttarakhand may act appropriately for the removal of illegal occupancy on the land diverted to the project.
- **Fish Impacts and Mitigation Strategy:**

Project proponent had informed the committee that the in EIA/EMP from 2007 presented the following information and mitigation actions as part of a Fisheries Management Plan to be carried out by the Dept of Fisheries (State) – these plans were not implemented, and original funds were not allocated as a final plan was not drafted and submitted to the Project proponent for implementation by State Fishery Department. There was a budgetary provision of INR 81 Lakh for the implementation of Fish management plan and at that time a fish hatchery was proposed downstream of the project who is yet to be implemented by Fishery department. In this regard Project proponent has done a meeting with Dy Director of State Fishery department at Dehradun and submitted their request for the approval of Fishery management plan. Project Proponent share the following facts about the fishery management plan as per 2007 EIA/EMP

Relatively good water quality but impacts in the areas above the reservoir during the pilgrim season but these seasonal due to high flows in the monsoon season. Project is in the ‘upper or headwater zone’ with low fish diversity, dominated by snow trout.

- 12 species were identified in the project area, non are classified as endemic or threatened.
- There are no commercial fisheries in the area – no introduction of exotic species.
- The main impact is on the stretch of the river below the dam/diversion where reduced flows will impact breeding areas and hamper movement due to potential habitat fragmentation.

E. Recommendations:

The recommendations of the sub-committee after site are as follows:

- Vegetative cover and forests being prime issue due to their predominant presence, any decision on Environment Clearance will heavily hinge on the forest clearance (FC) and NBWL clearance.
- PP shall carried out fresh baseline study to confirm species diversity and any changes, including possible reduction due to increased human activity and pollution in the upper stretches in and around the proposed reservoir.

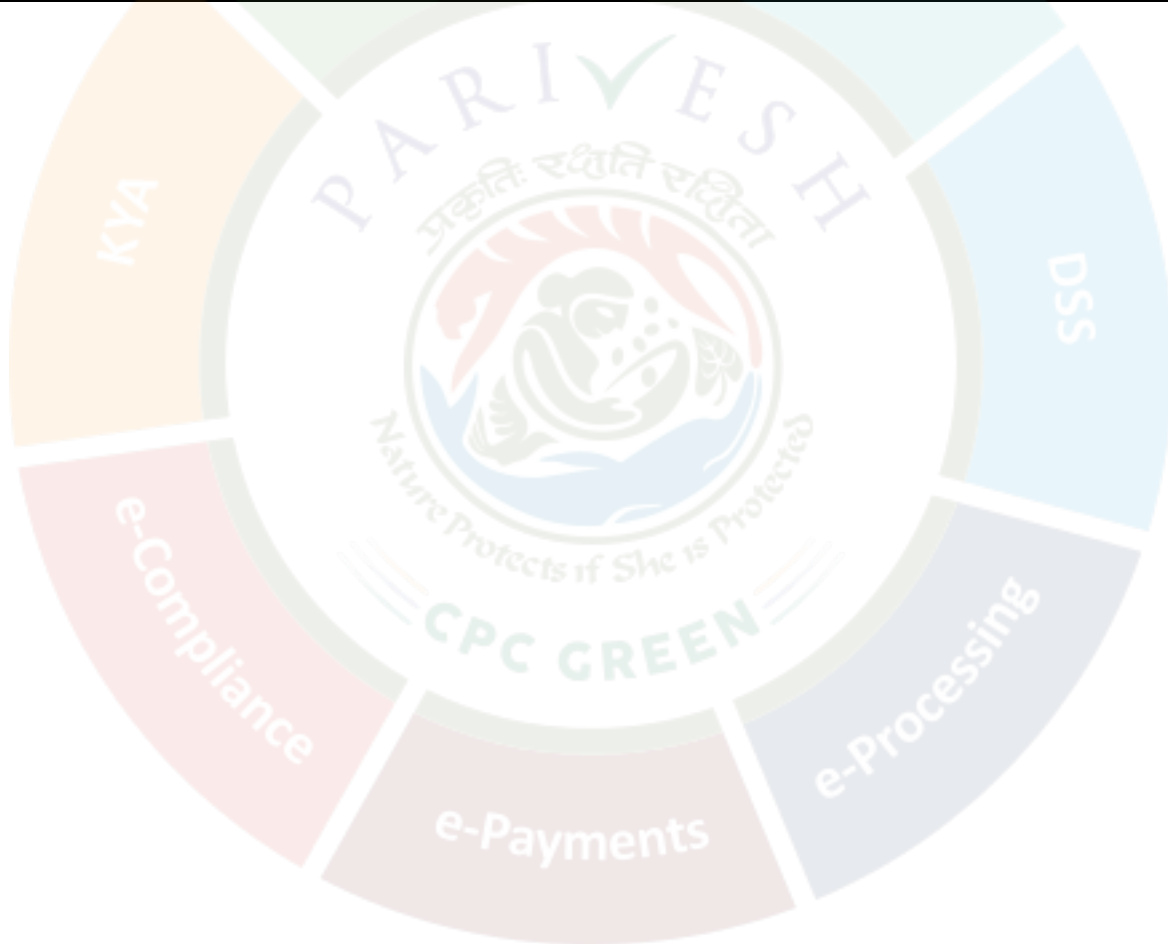
- Based on 2007 EIA / EMP study, since there are no endangered fish species found in this river stretch. However, there is a need to reassess the baseline and decision will be taken based on revised baseline report, while taking into consideration the technical and financial feasibility of the same in the project. Any examples of success in the Himalayas should be included in the assessment.
- PP shall ensure to release of E-flow release into the and prepare EIA/EMP as per the recommendations of CIA/CCS of upper reaches of ganga in Uttarakhand.
- Strategy for potential reservoir fisheries and tributaries, taking into consideration present human disturbance and pollution, given the fact that the dam could block the flushing of waste and poor water quality need to be included in the study.
- Identify the criteria/targets for water quality and waste management before any reservoir fisheries program could be implemented.
- Potential hatcheries and any other mitigation to enhance the above-mentioned mitigation.
- Proper investigation on the migration rout and breeding/spawning habitat of trout/mahseer needs to be carried out.
- Possibilities on the fish migration/fish ways through the dam shall be explored.
- Timeframe for the introduction of measures and targets, and monitoring linked to the construction and operations schedules.
- PP shall conduct study in consultation with government institution of repute such as CIFRI, to assess the impacts and formulate fish management plan in a time bound manner and recommendations to be implemented during preparation of EIA/EMP.
- Detailed study shall be carried out in terms of population to be effected during disaster such as caused in 2013, time to be taken to evacuate, plan shall be prepared for drill in every six months.
- A fresh socio-cultural-economic study should be conducted with the help of local institutes/some reputed institute or to understand present scenario as compared to 2013.
- Any design changes in the project details, PP shall obtain amendment in TOR, as there might be change in height of sluice gate, construction of embankments etc.
- PP shall carry out fresh seismic study and comparison shall be brought as compared to previous study carried.
- PP shall carry out geological study for land use and land cover over the period of 13 years from the date of EC granted earlier.
- Thoroughly checking the rework required like, cleaning, lining work, etc. in project and should be addressed with proper measures to ensure safety and efficacy.
- M/s Mandakini Jal Urja Private Limited shall develop a mechanism to avoid any issues wrt to payment of salary/dues of workers/labourers including grievance addressal system at the site office.
- Work towards control of erosion by implementing CAT plan shall be done to stop further landslides (if any) on the hill side of reservoir. The matter may be discussed with State Forest Department.
- Project Proponent to approach State Government to remove damaged vehicles/equipment's immediately to further avoid the blockage in the stream

- The project proponent shall develop certain infrastructure in support of state government for segregation and disposal of solid waste and initiate awareness campaign during peak season.
- Forest Department shall earmark the afforestation and CAT plan implemented earlier and further list of activities in CAT shall be revised as per recommendation of EAC/granted ToR.
- PP shall submit details of measures to be taken to ensure the safety of public during the period of pilgrimage while transporting the man, material and heavy equipment.



Some of the photographs during site visit are given below:





Approval of Chairamn (EAC Subcommittee)

Re: Draft Site Visit Report of Phata Bhyung held during 10.06.2024 to 14.06.2024

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The email has been sent from an external organization. Be alert when clicking any links, downloading attachments or sending sensitive information to this sender.

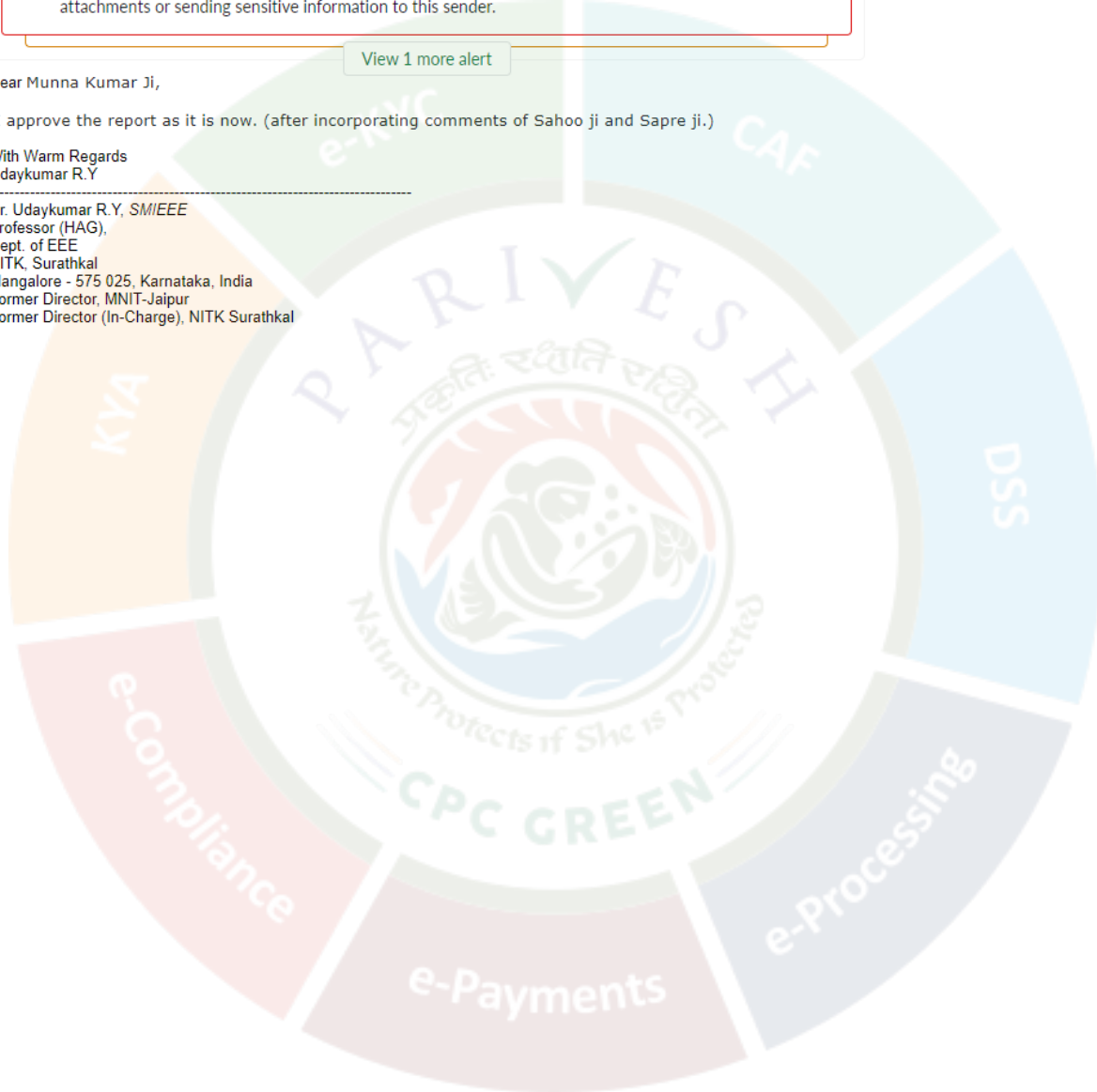
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Dear Munna Kumar Ji,

I approve the report as it is now. (after incorporating comments of Sahoo ji and Sapre ji.)

With Warm Regards
Udaykumar R.Y

Dr. Udaykumar R.Y, SMIEEE
Professor (HAG),
Dept. of EEE
NITK, Surathkal
Mangalore - 575 025, Karnataka, India
Former Director, MNIT-Jaipur
Former Director (In-Charge), NITK Surathkal



APPROVAL OF THE CHAIRMAN

===== Forwarded message =====

From: <chakrapani.govind@gmail.com>

To: "Yogendra Pal Singh" <yogendra78@nic.in>

Date: Wed, 02 Oct 2024 16:20:20 +0530

Subject: Re: Draft Minutes of Meeting of 16th EAC meeting held on 30.09.2024-reg

===== Forwarded message =====

Approved.
Chakrapani

