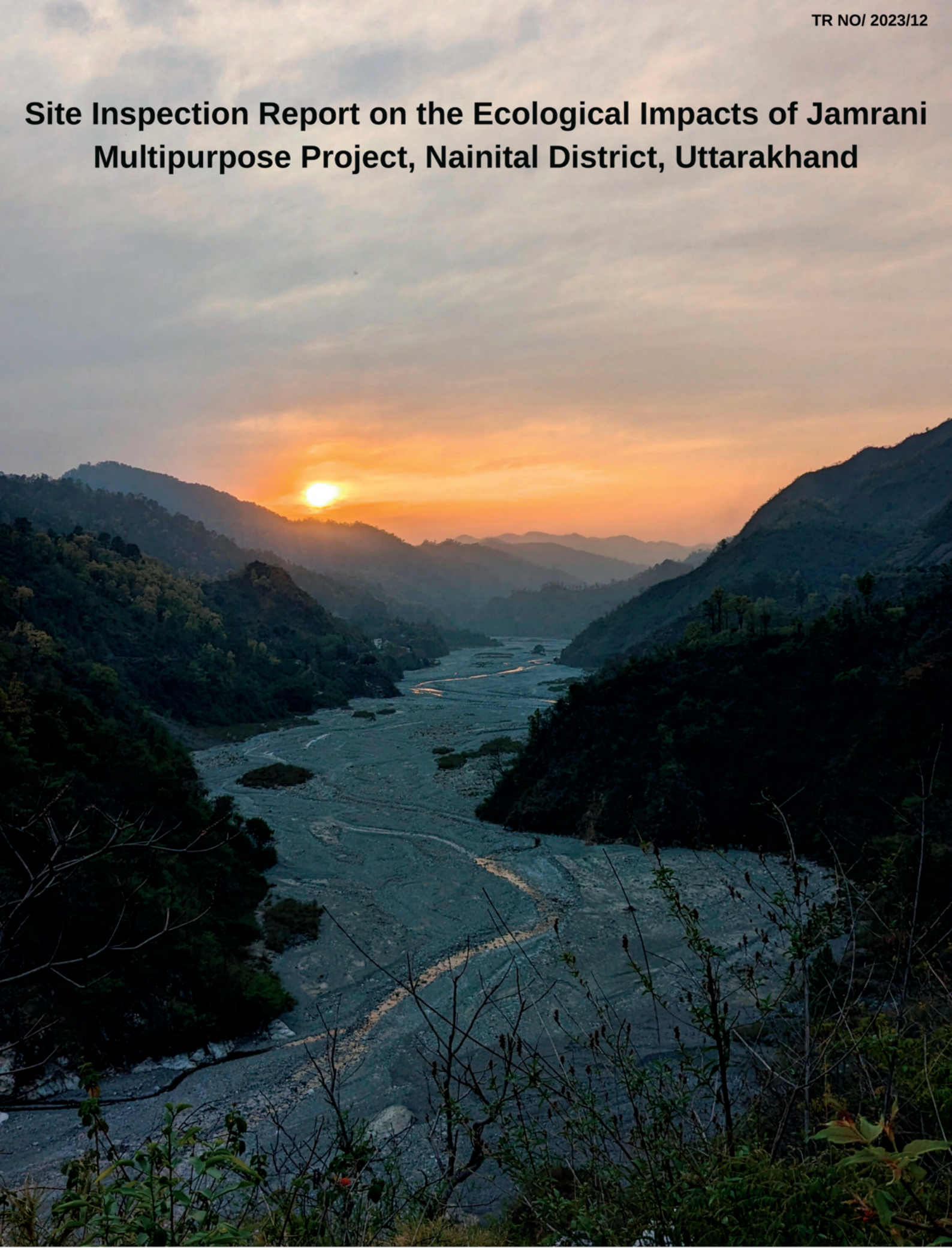
TR NO/ 2023/12

Site Inspection Report on the Ecological Impacts of Jamrani Multipurpose Project, Nainital District, Uttarakhand



भारतीय वन्यजीव संस्थान
Wildlife Institute of India

May 2023

Site Inspection Report on the Ecological Impacts of Jamrani Multipurpose Project, Nainital District, Uttarakhand

Submitted to National Tiger Conservation Authority

May 2023

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

Project Team

Advisors:

Sh. Virenda Tiwari, Director, WII
Prof. Qamar Qureshi, Scientist G

Research Team:

Dr. Gopi.G.V, Scientist F & Nodal Offier, WII-EIA Cell
Dr. Kausik Banerjee, Scientist, WII- Tiger Cell
Dr. Swati Saini, Scientist, WII - Tiger Cell
Mr. Deb Ranjan, Senior Project Associate, WII - Tiger Cell
Dr. Sumit K Arya, Senior Project Associate, WII - EIA Cell
Mr. Avinash Yadav, Project Associate, WII- EIA Cell
Ms. Stanzin Zangmo, Research Intern, WII – EIA Cell

Recommended Citation:

Gopi, G.V., Arya, S., Yadav, A., Zangmo, S., Saini, S., Laha, D, R. and Banerjee, K. (2023). Site Inspection Report on the Ecological Impacts of Jamrani Multipurpose Project, Nainital District, Uttarakhand. Wildlife Institute of India, Dehradun. TR/No/2023/12. Pp. 74.

Acknowledgement

We would like to express our gratitude to the Nainital Forest Department, Uttarakhand, for granting the necessary permissions and offering support throughout the field work. We thank Sh. Chandra Sekhar Joshi (Divisional Forest Officer, Nainital Forest Division), Sh. Hem Chandra (Sub Division Forest Officer, Nainital Forest Division), and Sh. Bhanu Prakash Harbola (Range Officer, Badon) for providing the necessary field support.

We thank Sh. Virendra Tiwari, Director, WII, Dr. Ruchi Badola, Dean, FWS, Dr. S. Sathyakumar, Registrar, WII and Prof. Qamar Qureshi, Nodal Officer, WII- Tiger Cell for their unwavering support throughout the duration of the study.

We extend our heartfelt gratitude to Sh. B.B. Pandey, Deputy G.M., PIU Jamrani, Sh. Lalit Kumar, Deputy G.M., PIU Jamrani, Sh. Shah Nawaz, Assistant Project Manager, Sh. S.K. Singh, Project Manager – I, Sh. Ajay Pant, Project Manager – IV and Sh. Dheeraj Beri Resident Engineer, providing assistance during the field studies.

Our sincere thanks are due to Sh. Deepak Kumar Tiwari, Deputy Range Officer, Nainital Forest Department, Sh. Hari Shanker Tamta, Forest Guard, East Okhaldhunga Beat and Sh. Lalit Singh Bora, Forest Guard, West Okhaldhunga Beat along with their forest staff, for their logistic support and cooperation during the field work conducted in and around the proposed Jamrani Drinking Water Multipurpose Dam, Nainital.

We would also like to acknowledge the support of Ms. Priyanka Das & Ms. Tamali Mondal for their contributions to the data analytical work. Sh. Karan Kumar and Sh. Vijay Joshi from the EIA cell, WII are thanked for all the help they rendered throughout.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Ministry of Environment, Forest & Climate Change, Government of India has accorded Environmental Clearance (EC) vide letter dated 13.12.2019 for Jamrani Dam Multipurpose Project, Nainital District with a condition to obtain No Objection Certificate from the National Tiger Conservation Authority (NTCA). In response, the NTCA requested Wildlife Institute of India, Dehradun (WII) on 2nd December 2022 vide letter no. 7-23/2021-NTCA, to assess the ecological impacts of the proposed dam at the cost of user agency and submit the assessment report to NTCA. Subsequent to this, a team was constituted at WII. The WII team visited the field site and collected primary field data, had meetings with the stakeholders and collated the necessary secondary information pertaining to this project. The proposed project falls within the Dudwa-Lagga Tiger Corridor, which is an important corridor for tigers in the Terai Arc Landscape. As this report is to facilitate and guide informed decision making by the NTCA, we present two decision making scenarios with differing objectives: (i) Keeping the Dudwa-Lagga Tiger Corridor intact and conserving this as utmost importance or (ii) Balancing the interests of both development and conservation values. Should the objective (i) be chosen, then the proposal has to be rejected, and if the objective (ii) is chosen then stringent compliance conditions has to be stipulated and an independent multidisciplinary committee comprising of members from NTCA, WII, FRI/ICFRE, State FD may be constituted to oversee the implementation of mitigation measures on a half yearly basis and submit their report to NTCA for strict compliance by the project proponent. This will facilitate a regular, transparent and stringent monitoring of compliance by the project proponent.

1. INTRODUCTION

1.1 Background

The Ministry of Environment, Forest & Climate Change, Government of India has accorded Environmental Clearance (EC) vide letter dated 13.12.2019 for Jamrani Dam Multipurpose Project, Nainital District with a condition to obtain No Objection Certificate from the National Tiger Conservation Authority (NTCA). In response, the NTCA requested Wildlife Institute of India, Dehradun (WII) on 2nd December 2022 vide letter no. 7-23/2021-NTCA, to assess the ecological impacts of the proposed dam at the cost of user agency and submit the assessment report to NTCA at the earliest.

The Jamrani Drinking Water Multipurpose Project, proposed in the Nainital district of Uttarakhand state received administrative approval from the former Uttar Pradesh government, and was technically approved for a budget of Rs 61.25 crore by the Planning Commission in 1975 (Jamrani Dam Construction Division-2, 2019). The scheme was subsequently accepted by the Advisory Committee on Irrigation, Flood Control, and Multipurpose Projects during its 43rd meeting on May 18, 1989 with a proposed budget of Rs 144.84 crore, subject to meeting certain specified conditions, including a detailed plan for rehabilitation and resettlement of affected tribal population; necessary environmental and forest clearance from the state government; and a strategy to utilize the water resources efficiently during the project execution period (Jamrani Dam Construction Division-2, 2019). At 2018 price levels, the project cost excluding the drinking water component, is estimated to be 2584.1 Crore. The cost of the drinking water component alone is approximately 355.0 Crore (https://www.jamranidam.com/about).

Afterwards, EC for the project was granted by Ministry of Environment, Forests, and Climate Change (MoEF&CC), GOI on 13th December 2019 vide letter no. J-12011/04/2007-IA-I(R). This approval was subject to complying with the standard EC conditions applicable to River Valley and Hydroelectric projects. As per EC condition no. 7(X), it has been identified that 24 sq.km area of Dudwa-Lagga Tiger Corridor is coming along the project area, by which a No Objection Certificate (NOC) from the National Tiger Conservation Authority (NTCA) is required. Furthermore, the project is located 6.28 km away from the Nandhaur wildlife sanctuary of which the final notification regarding the Eco-Sensitive Zone (ESZ) is pending. Thus, to meet the EC and ESZ criteria, the Uttarakhand Irrigation Department (Project Proponent) presents the proposal further to SC-NBWL for NTCA/wildlife clearance/NOC.

Subsequently, WII constituted a four members study team on 10th March 2023 vide letter no. WII-EIA/JAMRANI-DAM/UK/23, for carrying a rapid assessment of the proposed dam and further informed that the assessment report will be submitted to NTCA by the end of May 2023. The assessment is based upon both primary and secondary data where the latter information is obtained from the Tiger Cell at WII, while the primary data was collected by the research team of the Environmental Impact Assessment (EIA) cell, WII through field data collection at the proposed dam site and in its buffer areas, conducted from 18th April 2023 to 5th May 2023, for a period of around two weeks. The approach and observations made during the study are provided in the following paragraphs.

1.2 Chronology of events pertaining to Jamrani Drinking Water Multipurpose project.

- **5th May 1975** – The project first gets sanctioned by the Planning Commission, Govt. of India., vide letter no. II-2(43)/75-I&CAD for a budget of Rs 61.25 crore.

- 1981 - As part of Phase I of the project, construction of Gola barrage over Gola River at Kathgodam gets completed, along with the construction of 40.5 km canal and renovation of 244 km long canal network.

- 1988 – The state government submits hydrological studies to Central Water Commission (CWC) using data available until 1977, for construction of the main dam under Phase II of the project.

- **1989** – Technical Advisory Committee (TAC) grants approval for Phase II of the project, based on project's revised proposal. Phase II constitutes construction of the main dam with its three key components which are drinking water, power generation and irrigation canals components, along with remodeling and renovation of existing canals.

- **23rd April 2007** – Ministry of Environment, Forest and Climate Change, GOI accords clearance for pre-construction activities at the proposed sites given that the project proponent submits the necessary Terms of Reference as required by the ministry.

- 23rd July 2007 – After consideration of the revised Detailed Project Report (DPR), permission granted from Central Soil and Materials Research Station (CSMRS), Ministry of Water Resources, Govt. of India., vide letter no 29/36/Jamrani/BM-II/CSM/2006/680.

- 17th April 2008 – Deputy Secretary, Ministry of Tribal affairs (NGO Division), GOI writes to the Principal Secretary of Tribal Welfare Department, Govt. of Uttarakhand vide letter no. F.No.22040/106/2007-/NGO presenting NOC regarding Resettlement and Rehabilitation Plan (R&R Plan) of Jamrani DW Multipurpose Project.

- 2nd January 2009 – CWC (F.E. and S.A Directorate) GOI writes to Superintending Engineer, Irrigation Works Circle, Haldwani vide letter no. 2/2/2009/FE&SA/701 addressing the NCSDP 21st meeting held on 8th September 2009, where site-specific seismic study for the project was cleared.

- **25th April 2018** – Assistant Inspector General of Forests (FC) writes to the Principal Secretary, Forest department, Govt. of Uttarakhand vide letter no. 8-36/2013-FC approving Stage I Forest Clearance of the Central Government under Section 2 of the Forest Conservation Act 1980 for the diversion of 351.55 ha. (original proposed area 381.43 ha) of forest land in favour of Executive Engineer, Jamrani Dam project, Irrigation Department, GoU for the construction of Jamrani Dam, subject to the fulfillment of certain conditions.

- 25 May 2018 – Interstate MOU between Govt. of Uttarakhand and Govt. of UP takes place, related to the sharing of cost and water to be received from Jamrani DW Multipurpose project vide file no. 2/6/ISM-2/2017/189.

- **29th November 2018** – The project gets NOC/clearance of Ministry of Water Resources, RD & GR (Flood Management Wing) GOI from International/JRC Angle.

- 11th February 2019 – Revised DPR of the projects gets approved by TAC of Central Water Commission (CWC) for an amount of Rs 2584.10 crore.

- 2019 – Wildlife Conservation Plan for the proposed project is prepared by the Nainital Forest Division (Uttarakhand Forest Department) and submitted to MOEF&CC at the cost of Rs. 19.7 Cr. The plan aims for the conservation of Schedule-I species of WPA 1972 and other species.

- 27th February 2019 – 22nd meeting of EAC held where the proposal gets deferred sorting some additional information from the project proponent, including an update on EIA/EMP report on the basis of the requirement of one latest additional baseline data, downstream impact of the project up to Gaula Par village, impact on the E-flow and fish species due to the project, examination of periphyton composition and social impact assessment of the area in its latest context.

- 23rd September 2019 – 27th meeting of EAC held where EAC recommends for the grant of EC to the project, given that they fulfill certain additional information sought by the Ministry.

- **5th December 2019** – The project receives NOC from Ministry of New and Renewable Energy, GOI via email.

- **13th December 2019** – After examining all the documents submitted by the project proponent and following the recommendation made by EAC in its 27th meeting, the MoEF&CC accords EC to the given project vide letter no. J-12011/04/2007-IA-I (R), subject to the compliance of standard EC conditions for River Valley and Hydroelectric projects. According to EC condition no 7(X), project is found to fall in the Dudwa-Lagga tiger corridor by which "No objection Certificate" is sought from Nation Tiger Conservation Authority (NTCA). In addition, the project lies 6.28km from the Nandhaur wildlife sanctuary of which the final ESZ notification is not notified. Thus, clearance from Standing Committee of the National Board for Wildlife (SCNBWL) is also to be obtained.

- **17th December 2019** – The project receives clearance from National Mission for Clean Ganga (NMCG) vide file no. TE-11015/2/2019/NMCG/669.

- 18th December 2019 – The Screening Committee of the Department of Economic Affairs (DEA), GOI gave its approval to the project for external funding from the Asian Development Bank (ADB) under 80:20 funding arrangement. The approved project cost amounts to US $365.29 million, with the ADB's contribution totalling US $292.23 million.

- 27 November 2020 – MOU meeting takes place between the Irrigation departments of Uttarakhand and Uttar Pradesh, where distribution and regulation of available water from Jamrani Dam and Gola Barrage are discussed.

- June 2021 – Office of DFO, Nainital Forest Division (Uttarakhand Forest Department) prepares a Tiger Corridor Management Plan, as a supplementary document to the previously approved Wildlife Management Plan. This plan is created at a cost of Rs. 2.70 Cr.

- 8th July 2021 – A coordination meeting is held between Irrigation department of Uttarakhand and Uttarakhand Jal Vidyut Nigam (UJVN) regarding planning and development of power house and other associated works by UJVN at Jamrani Multipurpose DW Project.

- 26th October 2021 – The Chief Wildlife Warden of Uttarakhand recommends the project proposal with a set of conditions. These conditions require the user agency to comply with all provisions of the Wildlife Protection Act, 1972 as well as other relevant acts, rules, regulations, guidelines, and court orders. It is emphasized that the user agency must adhere to the Corridor Management Plan, and no labourer camps are permitted within forest land. Forest land can only be utilized for purposes specified in the proposal. Regular monitoring of the project by the concerned Divisional Forest Officer (DFO) or Director is also mandated. If necessary, the project also must obtain Environmental Clearance (EC) in accordance with the provisions of the Environment Protection Act, 1986.

- 2nd December 2022 – Deputy Inspector General (NTCA) requests WII to assess the ecological impacts of the proposed dam at the cost of the project proponent and report to NTCA at the earliest vide letter no. 7-23/2021-NTCA, in order to meet the concerns for tiger and Indian elephants of the affected area, which are not reflected well in the wildlife conservation plan and tiger corridor management plan prepared by the user agency.

- **16th January 2023** – Assistant Inspector General of Forests (FC) writes to the Principal Secretary, Forest department, Govt. of Uttarakhand vide letter no. 8-36/2013-FC approving the final/Stage II Forest Clearance of the Central Government under Section 2 of the Forest Conservation Act 1980 for the diversion of 351.55 ha. (original proposed area 381.43 ha) of forest land in favour of Jamrani Dam Multipurpose Project, subject to the fulfillment of certain conditions. For Stage-II forest clearance, around Rs 88.89 Crore has been paid to the forest department.

- 10th March 2023 – WII writes to the Executive Engineer (Jamrani Dam construction division 2) vide letter no. WII-EIA/JAMRANI-DAM/UK/23 informing the constitution of a study team of 4 members from WII along with proposed funds, required for carrying out the evaluation of ecological impact of the proposed project during mid-April 2023, with the objective of submitting the report to the NTCA latest by the end of May 2023.

- 24th March 2023 – Ministry of Finance, Department of Expenditure (PFC – I Division) directs to approve Jamrani Dam Multipurpose Project of Uttarakhand under Pradhan Mantri Krishi Sinchayee Yojana - Accelerated Irrigation Benefits Programme (PMKSY-AIBP), as discussed in PIB meeting held on 07.03.2023 for the appraisal of the same.

- 6th April 2023 – Nodal Officer, EIA Cell, WII writes to the Divisional Forest Officer, Nainital Forest Division vide letter no. WII-EIA/JAMRANI-DAM/UK_23 undertaking the site inspection of the proposed project by WII team, between 17th and 22nd April 2023 where few

researchers would continue to stay until 5th May 2023 for field data collection. It is further requested that a Forest department official be deputed to accompany the team during their site inspection visit.

- 6th May 2023 – Hon'ble High Court of Uttarakhand in its order dated 02.11.2018 (Writ Petition no.138 of 2017), directed the Chief secretaries of the state of U.P. and state of Uttarakhand to send the proposal before MoEF&CC to seek NOC for the construction of dam at the earliest. Accordingly, a Civil Contempt Petition No. 594 of 2019 dated 03.05.2023 was filed against the Chief Secretary, state of UK for non-compliance of the Judgement, by which the court has asked for a progress report in the form of response affidavit stating the current status on the matter. Executive Engineer (Uttarakhand Irrigation Department) writes to WII vide letter no. 64/EE/JDCD-2/NTCA/2023 informing about the next hearing by High Court of Uttarakhand to be held on 16th June 2023, for which the rapid assessment report is desired shortly.

Table 1: Summary of some important clearances and approvals obtained for Jamrani Drinking Water Multipurpose Project, Nainital.

Sr.no.	Clearances	Approval date	Letter no.
1.	Forest Clearance FC-Stage I	25th April 2018	8-36/2013-FC
2.	NOC from Ministry of New and Renewable Energy	5th December 2019	By email
3.	Environment Clearance (EC)	13th December 2019	J-12011/04/2007-IA-I (R)
4.	clearance from National Mission for Clean Ganga (NMCG)	17th December 2019	TE-11015/2/2019/NMCG/669
5.	Forest Clearance FC-Stage II	16th January 2023	8-36/2013-FC
6.	NBWL/NTCA	Decision awaited	NA

2. JAMRANI DRINKING WATER MULTIPURPOSE PROJECT

2.1 General description

The Irrigation Department of Uttarakhand has proposed the Jamrani Drinking Water Multipurpose Project on the Gola River, which falls under the Nainital Forest Division. The Gola River, a tributary of river Ramganga, is a flashy seasonal river, which originates from Paharpani of Kumaon Himalayas and flows through south-eastern Kumaon in the state of Uttarakhand, India. The proposed project involves building a roller compacted concrete gravity dam measuring 480 meters long and 150.60 meters high (above river bed level) across the Gola River in Jamrani village. It is located at 29°16'15" north latitude and 79°36'36" east longitude (https://www.jamranidam.com/PDFFile/Salient%20Features/salient-features.html), at approximate 10 kilometres upstream from the existing Gola barrage near Kathgodam, Nainital district of Uttarakhand. The proposed dam is expected to create a reservoir with a maximum capacity of 208.6 MCM and a live storage of 142.72 MCM. This project aims to utilize the live storage for various purposes, including drinking water supply to Haldwani township (42.7 MCM), irrigation over an area of 57,065 ha (9,458 ha in Uttarakhand and 47,607 ha in UP), and power generation with an installed capacity of 14 MW. It requires 475.19 hectares of land, of which 351.55 hectares is forest land. By providing a consistent supply of water to the current

irrigation systems and fulfilling the domestic water demands of Haldwani City, the proposed project aims to offer various direct and indirect benefits.

The project was subsequently divided into two phases for implementation. Phase-I involved the construction of the Gola barrage, along with a 40.5 km canal system and the renovation of approximately 244 km of existing canal system. This phase was completed in 1981 and currently provides additional irrigation to an area of 10,500 ha. Under phase-II, construction of Jamrani dam is proposed so as to provide augmentation storage for Gola barrage (Jamrani Dam Construction Division-2, 2019).

2.2 Project site and components

The construction of the main dam is across Gola River, of which the water comes from the runoff produced during the monsoon season. During the drier season, the discharge progressively decreases in the river which is inadequate to meet the drinking water needs of the Bhabar region of Nainital district. Up to the dam site, the Gola River has a catchment area spanning 450 sq.km. The surrounding area comprising Bhabar land has huge deposits of boulders and debris where surface flow absorption is high. This area experiences difficulty in water excavation due to its boulder strata. To the south of Bhabar lies a region known as Terai, characterized by highly fertile land. The irrigation systems in this area rely on the unpredictable and insufficient water supply from various small streams that experience fluctuating flows. Further to the south, Gangetic alluvial plains exist in the districts of Rampur and Bareilly, where large industrial units are set up (Jamrani Dam Construction Division-2, 2019).

The Gola river basin which is a tributary of Ramganga River, experiences its monsoon in the month of June to September during which the mean temperature varies between 20°C to 30°C. The winter lasts from early November to mid February where temperature can reach 10°C. Summer occurs between March to May and the temperature varies between 35°C to 42°C. The average annual rainfall in the basin is 1500 mm where maximum precipitation is received in the monsoon season (Jamrani Dam Construction Division-2, 2019).

The construction of Jamrani Drinking Water Multipurpose Dam is divided into three main components as follows:

i) Dam, Reservoir and Irrigation Canals

This component includes the main dam. The height of the dam is 150.6m (above the riverbed), with a maximum foundation thickness of 166.5 m and a top thickness of 10m. The length of the dam at its upper part is 480m, and its crest is situated at an elevation of 749m (Jamrani Dam Construction Division – I, 2009). Additionally, the project includes the construction of two coffer dams. The upstream coffer dam has a height of 14m, a top width of 6m, and slopes of 2:1 (upstream) and 1:5:1 (downstream). This structure is designed to divert the specified discharge into the diversion duct. On the other hand, the downstream coffer dam, which has a height of 3.20m above the river bed level, a top width of 6m, and slopes of 1:5:1 (upstream) and 2:1 (downstream), will help prevent the backward flow of non-monsoon discharge, which is expected to be around 315 cubic meters per second, towards the dam. Moreover, the dam will create a reservoir that can hold a maximum volume of 208.6 Mm^3 and has a live storage capacity of 144.3 Mm^3 when the reservoir is filled to its maximum level of 762.00m. The reservoir spans a length of 9 km and is supported by a catchment area of 452sq.km. The submergence area of the reservoir is estimated to be 452 ha according to the Jamrani Dam Construction Division – I

(2009) report. Moreover, the project includes the construction of Terai and Chakferi Feeders, canals that are 18.566 km and 2.684 km long respectively. These canals will provide water to the seasonal rivers, namely Baigul, Haldi, Chakferi, Khairiya, and Dhimri, which are located within the Terai Central Division of the Forest Department in Uttarakhand (Jamrani Dam Construction Division – I, 2009).

ii) Power generation

A power house on the right bank of the Gola River is proposed, with the dimension of 55.30m×23m×14m. It is expected to generate 14MW (63.3MU) hydro-electricity annually. The generated electricity will be transmitted to the Ranibagh Sub Station through approximately 10 km of transmission lines. Type of turbine used for the powerhouse is Vertical Francis turbine and the minimum and normal tail water level are 632m and 643m respectively. The clearance for this power house is included in the forest land clearance of the Dam component. However, clearance for the transmission lines of power component from the concerned departments may apply separately (Jamrani Dam Construction Division – I, 2009).

iii) Drinking water

As part of the drinking water component, Gola Barrage was constructed early in 1981 in the phase I of the project. It is the main diversion work – a barrage across the Gola River near Kathgodam town. The salient features of the Gola barrage is given below:

Table 2: Salient features of Gola barrage located in Kathgodam across the Gola River.

Features	**Measurement**
Total Length of barrage	81m
Gate size	11.5m × 4.50m
Maximum Pond Level	510.75m
Crest level of other bays	506.5m
Crest level of sluice bays	506.5m
Bed level of river downstream	502m
Design discharge	3250 cumec
CCA	60,600ha
Area being irrigated at present	78,786 ha
Further area proposed to be irrigated	60,000 ha
Total irrigated area	1,39,386ha
Existing average intensity of irrigation	52.4%
Proposed average intensity of irrigation	92.7%
Total requirement of water for irrigation	417.19 MCM

Table 3: Summary of various structures involved in the three components of the project.

Sr. no.	**Structure**	**Location**	**Proposed dimension**	**Component**	**Purpose**
1.	Main Dam	Across Gola River	Height (above river bed level) is 150.6 m; Thickness (at	Dam, Reservoir & Irrigation	To supply 117 million litres per day (MLD) of drinking water to Haldwani and nearby regions; to enhance irrigation capacity in the command area

			deepest foundation) is 166.5 m; Thickness (at top) is 10.0 m. Length (at top) is 480.0 m, and Crest level is 749m.		from 158.85% to 196.88%, resulting in an additional irrigation area of 57,065 Ha (47,607 Ha in UP and 9,458 Ha in UK) within the cultivable command area of 150,027 Ha. Furthermore, to generate 14 megawatts (MW) of hydropower, resulting in an annual power generation of 63.4 million units (MU)
2.	Two coffer dams (CD)	One at upstream of the main dam, and other at the downstream of the main dam	<u>Upstream CD:</u> Height= 14 m Top Width =6m Upstream slope= 2:1 and downstream slope= 1.5:1 <u>Downstream CD:</u> Height= 3.20 m above river bed level; Top width of 6 m; Upstream slope= 1.5:1 and downstream slope= 2:1	Dam, Reservoir & Irrigation	<u>Upstream CD:</u> to divert the design discharge into the diversion duct <u>Downstream CD:</u> To check the back flow of non-monsoon discharge of 315 m3/sec towards the dam.
3.	Reservoir (4.28 sq.km)	upstream of the dam	-	Dam, Reservoir & Irrigation	To hold a live storage water capacity of 144.3 Mm^3 given the reservoir is filled to its maximum level of 762.00m.
4.	Terai Feeder (canal)	From the existing Haripura Feeder at chainage 2.68 km.	Length: 18.566 km	Dam, Reservoir & Irrigation	To provide water to seasonal rivers namely Baigul, Haldi, Chakferi, Khairiya and Dhimri, which are present in the area of Terai Central Division of Forest Dept. Uttarakhand.
5.	Chakferi Feeder (canal)	Location not known	Length: 2.684 km	Dam, Reservoir & Irrigation	To provide water to seasonal rivers namely Baigul, Haldi, Chakferi, Khairiya and Dhimri, which are present in the area of Terai Central Division of Forest Dept. Uttarakhand.
6.	Power house building	Located at the right bank of Gola river, at the toe of dam and 150m downstream from the main dam.	55.30m x 23m x 14m	Power generation	To generate 63.4 MU of hydroelectricity annually.
7.	Gola	10 kms	11.5m × 4.50m	Drinking	To divert drinking water to

	Barrage (existing)	downstream of the proposed dam, over Gola river at Kathgodam.		Water	Sheeshmahal filtration plant
8.	Golawar main (existing canal)	Right bank of the Gola barrage		Drinking Water	For the distribution of water from the dam to the surrounding areas.
9.	Golapar main (existing canal)	Left bank of the Gola barrage		Drinking Water	For the distribution of water from the dam to the surrounding areas.
10.	Intake Structure	Near the tail race of the power house	Size is 1.66m (W) × 2m (H)	Drinking Water	To collect water that will be supplied to a water treatment plant through gravity mains.

Figure 1: A meeting comprising members from WII (Dehradun), NTCA (New Delhi) and PIU (Jamrani), at Uttarakhand Irrigation Department Office, Kathgodam (Haldwani) on 18.04.2023, to discuss the various aspects of Jamrani Drinking Water Multipurpose Project, Nainital, Uttarakhand.

Figure 2: Site inspection on 18.04.2023 by WII study team at Gola barrage (Kathgodam), constructed in Phase I of the Jamrani Drinking Water Multipurpose Project.

Figure 3: Golapar Main Canal (18.04.2023)

Figure 4: Site inspection on 18.04.2023 by WII study team at Powerhouse unit of the Jamrani Drinking Water Multipurpose Project, Nainital, Uttarakhand.

Figure 5: WII study-team visit to the proposed dam site on 18.04.2023

Figure 6: Meeting led by Mr. Chandra Sekhar Joshi, DFO (Nainital Forest Division) and staffs of Nainital Forest Department on 19.04.2023 with the study team of WII, NTCA and members of PIU (Jamrani) at DFO Office, Nainital.

3. PROJECT BENEFITS

i) Preserving Groundwater and ensuring access to Drinking Water

Haldwani city in Uttarakhand has been having a population influx over the last few years due to people migrating from the hilly areas in the foothills of Kumaon Himalayas towards Haldwani and nearby areas. This has led to an increase in the demand for drinking water in the area where more than 4,00,000 inhabitants exist (Cauchois *et al*., 2022). Currently, the city meets its drinking water needs from pumping large amounts of water using tubewells, by which the ground water level in the area has been depleting rapidly over the last 10 years where water table has depleted by more than 15m. The water requirement in the area is further expected to double with the increasing population which is expected to reach 10, 70,000 inhabitants in the next 30 years (Cauchois *et al*., 2022). According to Ground Water Resource Estimation (2020) conducted by Central Ground Water Board, the stage ground water extraction in Haldwani Block is 84% which is categorized as "Semi Critical". This, in comparison with other districts of Uttarakhand like Ramnagar where stage ground water extraction is 34.64%, raises an alarming concern regarding the availability of drinking water resource in the city of Haldwani.

The proposed Jamrani Dam aims to provide drinking water to the Haldwani city and the nearby areas. Furthermore, the dam will help to improve the groundwater level and baseflow of the area, thereby increasing the water flow in the streams of areas like Terai (Jamrani Dam Construction Division – I, 2009). In addition, it is known that the seasonal flow of the Gola River is not enough to meet the drinking requirements in the Bhabar area in Nainital District

also. The Bhabar belt has limited ground water potential by which Jamrani Dam can be of value to the area to meet agricultural and industrial development needs (Cauchois *et al*., 2022).

ii) Irrigation

The Jamrani project covers a Cultivable Command Area (CCA) of 150,027 ha, spanning across Uttarakhand and Uttar Pradesh. The CCA comprises fertile lands known as Bhabar and Terai in Uttarakhand, and Gangetic in Uttar Pradesh. These lands are highly productive and offer great agricultural potential. The project's assured irrigation will enhance crop productivity and yield especially for high value vegetables like tomatoes and broccoli. The cultivation of such crops comes across many restrictions under limited irrigation otherwise. Efficient irrigation techniques can be adopted such as drip and sprinkler systems, that will facilitate the cultivation of such crops that will be linked to markets to ensure fair pricing for farmers. In addition, cultivable area will expand as additional barren and non-agricultural lands will be brought under irrigation (https://www.jamranidam.com/about).

iii) Hydropower

The project includes a small dam toe powerhouse with a capacity of 14 megawatts (MW). This powerhouse is equipped with four vertical francis turbines, each with a capacity of 3.5 MW. These turbines generate approximately 63.4 gigawatt hours (GWh) of electricity annually, based on a 75% dependable year. Although power generation is not the primary focus of the project, this additional electricity production is significant as it helps meet the current power demand in the state, which is not in a surplus state. The cost of this powerhouse and its associated components, including the intake and penstock construction, powerhouse civil works, switchyard complex, tailrace canal, electro-mechanical equipment installation, and power evacuation system to the Kathgodam Substation located 15 km away, is estimated to be around ₹81 crores (approximately $11.2 million).

iv) Pisciculture

The Environmental Management Plan of the project, prepared by Jamrani Dam Construction Division-1(Irrigation Department, UK) found that the affected area of the Gola River had a population of 2-7 fish species, with the upstream region not suitable for endemic or migratory fish species. Limited information on the induced breeding technique of snow trout makes it difficult to cultivate, but brooders of migratory Mahseer and other fish species can be obtained from the river, small spring-fed tributaries, or lakes and artificially spawned through striping. The reservoir can also be stocked with fish species such as *Labeo sp*., Grass carp *Ctenopharyngodon idella*, Silver carp *Hypophthalmichthys molitrix*, Common carp *Cyprinus carpio*, *Catla sp*., and others. A plan has been put forth to utilize artificial propagation methods and stock the reservoir with indigenous species such as *Schizothorax sp*. (Asla) and *Tor sp*. (Mahseer) to sustain aquatic life and maintain water quality. The estimated average sustainable fish catch per hectare is around 60 kilograms, with an average market rate of Rs. 175 (https://www.jamranidam.com/about). This overall project is expected to cost around 80 lakh rupees (INR) (Jamrani Dam Construction Division-1, n.d.).

v) Employment generation

According to the Fisheries Management Plan prepared by Jamrani Dam Construction Division-1, the progress and effectiveness of the initiative regarding the improvement of pisciculture through this project will be closely monitored to assess the survival rate of the stocked fish. Additionally, the hatchery-produced seeds will be made available to private entrepreneurs and fish farmers in the region to encourage fish cultivation. This approach serves the dual purpose of creating employment opportunities and generating income while alleviating the strain on natural fish populations. Furthermore, the power generation from the project would improve industry and market centres in the area; and the dam itself will be capable of covering a water surface area of 4.28 square kilometers when it reaches its maximum capacity, by which large-scale fish farming can be practiced which will eventually lead to more job opportunities.

vi) Flood protection

Flood discharge with respect to Gola River is high, given that its catchment area is small and the river itself has a rapid flow. This causes damage to the dam infrastructure as well as to the nearby agricultural fields, culverts, dykes, embankments etc. The Jamrani Dam is expected to provide storage of an adequate capacity to the flood water that may get wasted otherwise. In addition, flood damages will be reduced which will in turn cut the cost for Uttarakhand Government Departments (https://www.jamranidam.com/about).

vii) Tourism benefits

The proposed Jamrani Reservoir will be surrounded by villages, some of which will become a part of the tourism circuit. The circuit will consist of a road along the reservoir, a small market for herbal products, a handicraft complex, and local goods. The reservoir is also expected to attract more tourists due to its proximity to the Kathgodam rail head. Water sports, boating, underwater sightseeing, and fishing spots are among the activities that will boost tourism in the region. It is estimated that around 70% of the 10 lakh tourists who visit Nainital district every year will visit the Jamrani Dam's reservoir area. This is expected to lead to the growth of home stays, hotels, and resorts in the area (https://www.jamranidam.com/about).

4. ECOLOGICAL IMPACTS OF CONSTRUCTING DAMS AND RESERVOIRS

Since ancient times, dams have been used to control river flows and provide a sufficient water supply during dry seasons. Many people believe that more dams will be required in the future as populations grow and water usage and electricity demand rise. Many social and economic justifications are used to oppose dams. Still, many of these arguments are based on the reality that dams, particularly large dams, cause significant biological changes in river ecosystems. Dams have consequences for both upstream and downstream ecosystems, acting as barriers to the longitudinal exchange along rivers and interfering with various natural environmental processes.

4.1 Impact on terrestrial habitats and large mammals

Owing to their life history strategy, large mammals like tigers and elephants need vast territories to sustain their otherwise low-density population. Building reservoirs in potentially tiger/elephant residing areas can lead to a direct habitat/corridor loss for these apex predators

which are vulnerable towards habitat loss, fragmentation, degradation and even local extinction (Palmeirim & Gibson, 2021). Submerged areas created by dams/reservoirs cannot be retrieved while such flooded areas of terrestrial habitats could be of high value to these predators as well as for herbivores upon which they are dependent for food. In Sumatra, Indonesia, two dams are planned for construction near the Leuser Ecosystem. It is home to a critically endangered subspecies of tiger - Sumatran tigers. These dams have the potential to disrupt the goal of doubling the global population of tigers, as set in the St. Petersburg Declaration on Tiger Conservation (Luskin *et al*., 2017). These developmental projects could actually hinder the breeding, metapopulation dynamics and survival efforts made for such significant species. In Brazilian Pantanal, a wetland in South America, one population of marsh deer *Blastocerus dichotomus* decreased by 54% following the construction of a dam. This decline was attributed to the reduction of suitable habitat and the degradation of food resources (Andriolo *et al*., 2013).

4.2 Impact on water quality

It is reported that water quality of dams, particularly large dams have comparatively poor quality due to its storage in deep reservoirs for long durations, lacking a basic flow for the intermixing of atmospheric oxygen with water. Without oxygenation, the water becomes anaerobic sometimes that poses a threat to the aquatic ecosystem downstream (Baird *et al*., 2021). When new reservoirs are made without removing the vegetation, it may further cause eutrophication (Goldsmith and Hilyard, 1984; McCully, 1996; World Commission on Dams, 2000) leading to several water quality related problems such as blue green algae toxicity (Wyatt and Baird, 2007) and gas super saturation (Abernethy *et al*., 2001). In addition, methylmercury production poses a significant threat to the food chain within ecosystems. Under anaerobic conditions of water, the conversion of inorganic mercury to methylmercury by anaerobic bacteria is known to occur. This process has detrimental effects on the health of fish, as well as humans who consume these contaminated fishes. Through bioaccumulation, methylmercury multiplies and concentrates as it moves up the food chain, posing a particular risk to wild animals at higher trophic levels. The consumption of these contaminated fishes can impair their immune systems and overall functioning (Bodaly *et al*., 2004; Hall *et al*., 2005).

4.3 Impact due to anthropological activities

The construction of Jamrani dam is planned for five years, during which human activities is bound to increase. Such anthropological interference and the additional dust and noise pollution created by the influx of vehicles will have a negative impact on the biodiversity of the area. Not just the apex predators like tigers, but species at smaller trophic levels will take a massive impact upon their daily circadian rhythm, disrupting their natural behaviour, change in breeding grounds and reproduction courses and might even cause site abandonment. The presence of vehicles offroading along the river during the five-year construction period also poses a significant threat to the survival of aquatic life, particularly the fish population and avifauna.

4.4 Impact due to linear infrastructure of dams

The construction of dams acts as a barrier and leads to habitat fragmentation of fishes and other wild animals. This disrupts their population distribution and abundance over an area as

well as fish's seasonal reproductive migration (Agostinho *et al*., 2007; Pelicice and Agostinho, 2008) in addition to other behavioural stress that such structures may cause upon their functioning. Such barriers also block the natural flow of nutrients and sediments in the river (Beck *et al*., 2012) and sedimentation from dams can affect the deltas and estuaries downstream of the river. Moreover, some fishes have a critical threshold of water level and velocity required for their survival, which is compromised under such barrier effects (Bunn and Arthington, 2002; Dugan *et al*., 2010).

5. PRIMARY DATA COLLECTION

As discussed, dams can have various negative impacts on wildlife population in the surrounding areas, including changes to water levels, changes to water quality, and modifications to river flow patterns. These changes can consequently impact their food and habitat availability, disrupt migration patterns, and alter breeding and foraging behaviours. Accordingly, researchers have employed various monitoring methods and camera trapping to assess dams' impact on wildlife populations.

Camera trapping is a widely used tool for studying the ecology of wildlife population. It involves the deployment of motion-sensor cameras in locations where animals are known to congregate, such as near water sources, trails, or feeding areas. When an animal passes in front of the camera, it is triggered, taking a photograph of the animal. This data can then assess population density, behaviour, and distribution patterns. In this section, the use of camera trapping methodology is examined in studying the effects of the proposed Jamrani dam on local fauna, focusing on the deployment of cameras upstream and downstream of the Gola River.

Figure 7: Installation of camera traps by WII research team, accompanied by forest staffs (Nainital forest division).

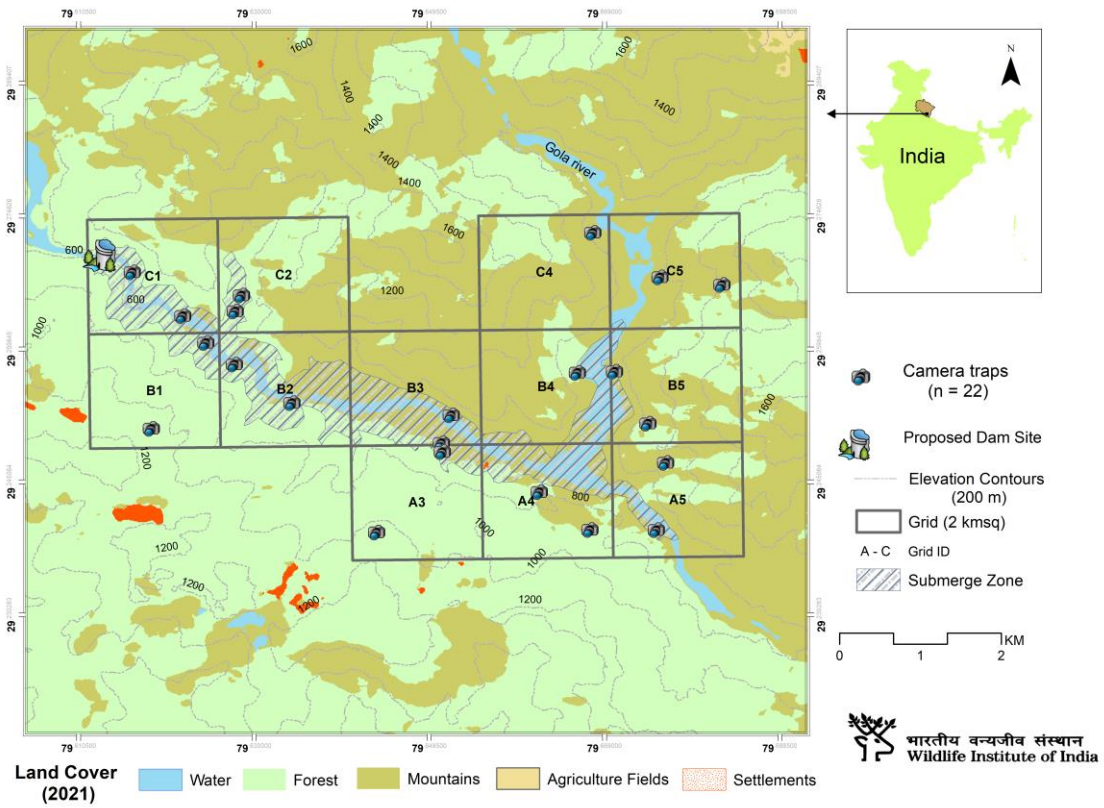


Figure 8: Location of camera traps deployed near proposed Dam Site.

Figure 9: A camera trap installed in close proximity to the proposed dam site.

5.1 Study area

To study the impact of dams on wildlife population, we first assessed the habitats near the proposed Jamrani dam site. The forest type found in these lower Himalayas is predominantly sub-tropical pine forest (Gairola *et al*., 2011). These forests are characterized by the dominance of Chir pine *Pinus roxburghii* and Sal Forest *Shorea robusta* (Dangwal *et al*., 2014). The forest provides habitat to a diverse range of wildlife including leopards, barking deer, Himalayan goral, Himalayan black bear, Himalayan grey langur, and various species of birds (Pant *et al*., 2014). The elevation near the proposed dam site varies depending on the specific location within the region, as it is characteristic of undulating hilly terrain. The range of elevation varies between 1,400m (4,593 feet) to 1,600m (5,249 feet) above sea level (USGS Earth explorer, 2023). During the fieldwork, an extensive reconnaissance survey near the proposed dam site and also in Badon range, Nainital Forest area was carried out. During the survey, we collected forest cover data, animal signs and socio-economic data that were recorded and geo-referenced using geographical positioning system (GPS).

Figure 10: Proposed Jamrani Drinking Water Multipurpose Dam Site

5.2 Camera trapping exercise

A rapid field survey from 18 April 2023 to 05 May 2023 was carried out. During this period, Keyhole Markup Language (kml) files, shapefiles of the proposed dam site location and the submerged dam & affected area from the irrigation department were collected. A square grid framework of 2 km^2 over the submerged area through Arc GIS 10.5 (GIS Software) was laid, and then camera traps were deployed in locations where animals are known to congregate, such as along riverbanks, riparian zones, or areas where animals cross the river and also in hilly regions where indirect animal signs were found. A total of 22 camera traps were deployed in 12 grids. Each camera traps were deployed at various locations upstream and

downstream of the Gola River. A single camera trap was set up at each station, approximately 50 cm above the ground, aimed parallel to the ground to ensure maximum coverage. The camera traps were programmed to take sequential photographs with a one-second delay between exposures and record the date and time of each exposure. They operated continuously for 24 hours a day and were installed for a maximum of 10 days at each station. Cameras were checked every two or three days at intervals to replace the batteries and memory cards and to ensure their proper functioning. The installation and retrieval time of each camera were recorded to calculate the total duration of sampling. To determine the total number of camera trap days at each sampling site, the total sampling duration (in hours) was divided by 24 (Debata *et al*., 2018).

5.3 Data analysis

Once all the camera traps were retrieved, the photographs were closely examined to identify the animals captured in the images. The identification process was done with great care and the animals were identified up to the species level (Menon *et al*., 2014). The photos were separated based on an interval of 30 minutes while animals captured in greater time interval were classified as independent events (Ohashi *et al*., 2013; Guo *et al*., 2017). To estimate the abundance of each species, a Relative Abundance Index (RAI) was calculated. RAI was determined by dividing the total number of independent detections of a species (A) by the total number of camera trap days (N) used throughout the study area, then multiplied by 100 (Jenks *et al*., 2011).

$$RAI = A/N \times 100$$

The IUCN Red List (2021) was used to evaluate the conservation significance of the identified species on both global and national levels based on their assigned categories.

5.4 Results

During the camera trapping study, a total of 12,032 photographs were captured over 2,200 trap nights across 22 locations. Of these photographs, 947 showed wild mammals belonging to 14 different species from five different orders (Appendix 1). Among these photographed species, two species are classified as vulnerable (VU) according to the IUCN Red List: The Leopard *Panthera pardus* and the Sambar deer *Rusa unicolor*. Additionally, two species that are categorized as near threatened (NT): the Himalayan serow *Capricornis sumatraensis thar* and the Himalayan goral *Naemorhedus goral*. The remaining species in the study are classified as least concern (LC) in the IUCN Red List. The proposed project area also harbours 7 Schedule I and 4 Schedule II species, which are accorded highest protection under the Indian Wild Life (Protection) Act, 2022.

The following Table no. 4 presents a list of all the identified species observed during the camera trapping study, along with their common and scientific names. It also includes the total number of photographs captured for each species, as well as their RAI and the number of locations where each species was photographed. and the RAI of the mammal species are as follows: Himalayan goral *Naemorhedus goral* (0.08 ± 0.23), Nepal gray langur *Semnopithecus schistaceus* (0.14 ± 0.49), Himalayan serow *Capricornis sumatraensis thar* (0.04 ± 0.15), Indian hare *Lepus nigricollis* (0.16 ± 0.41), Southern red Muntjac *Muntiacus muntjak* (0.07 ± 0.13), Indian crested porcupine *Hystrix indica* (0.02 ± 0.05), Jungle cat *Felis chaus* (0.02 ± 0.07) Leopard *Panthera pardus* (0.01 ± 0.03), Leopard cat *Prionailurus*

bengalensis (0.01 ± 0.05), Rhesus macaque *Macaca mulatta* (0.57 ± 1.68), Sambar deer *Rusa unicolor* (0.07 ± 0.20), Small Indian mongoose *Herpestes auropunctatus* (0.01 ± 0.04), Wild pig *Sus scrofa* (0.22 ± 0.63), Yellow-throated martin *Martes flavigula* (0.02 ± 0.07).

Table 4: List of all the identified species observed through camera traps with their Relative Abundance Index (RAI).

Sr. no.	Species	Scientific Name	IUCN Red List Status	WPA Schedule (1972)	WPA Schedule (2022)	Total Individual captured	RAI
1.	Himalayan goral	*Naemorhedus goral*	Near threatened	III	I	17	0.08 ± 0.23
2.	Nepal gray langur	*Semnopithecus schistaceus*	Least concern	II	I	31	0.14 ± 0.49
3.	Himalayan serow	*Capricornis sumatraensis thar*	Near threatened	I	I	9	0.04 ± 0.15
4.	Indian hare	*Lepus nigricollis*	Least concern	IV	II	35	0.16 ± 0.41
5.	Southern red muntjac	*Muntiacus muntjak*	Least concern	III	III	15	0.07 ± 0.13
6.	Indian crested porcupine	*Hystrix indica*	Least concern	IV	IV	5	0.02 ± 0.05
7.	Jungle cat	*Felis chaus*	Least concern	II	I	5	0.02 ± 0.07
8.	Leopard	*Panthera pardus*	Vulnerable	I	I	2	0.01 ± 0.03
9.	Leopard cat	*Prionailurus bengalensis*	Least concern	I	I	3	0.01 ± 0.05
10.	Rhesus macaque	*Macaca mulatta*	Least concern	II	IV	126	0.57 ± 1.68
11.	Sambar deer	*Rusa unicolor*	Vulnerable	III	I	16	0.07 ± 0.20
12.	Small Indian mongoose	*Herpestes auropunctatus*	Least concern	II	II	2	0.01 ± 0.04
13.	Wild pig	*Sus scrofa*	Least concern	III	II	49	0.22 ± 0.63
14.	Yellow-throated marten	*Martes flavigula*	Least concern	II	II	4	0.02 ± 0.07

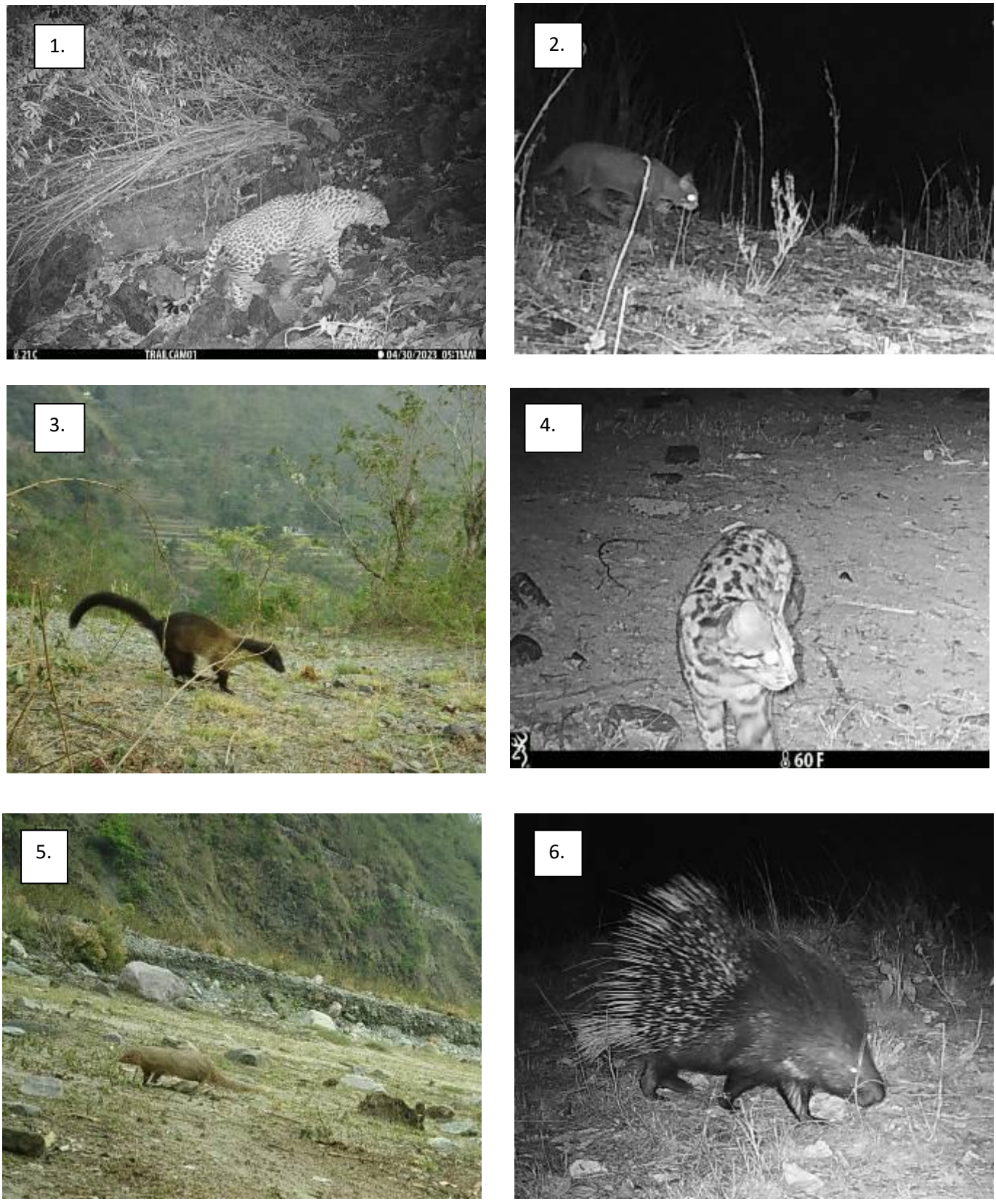


Figure 11: Wildlife species captured in deployed camera traps - 1. Leopard 2. Jungle cat 3. Yellow-throated marten 4. Leopard cat 5. Small Indian mongoose 6. Indian crested porcupine

Figure 11 (Contd.): 7. Southern red muntjac 8. Himalayan goral 9. Himalayan serow 10. Sambar deer 11. Wild pig 12. Nepal gray langur 13. Rhesus macaque 14. Indian hare

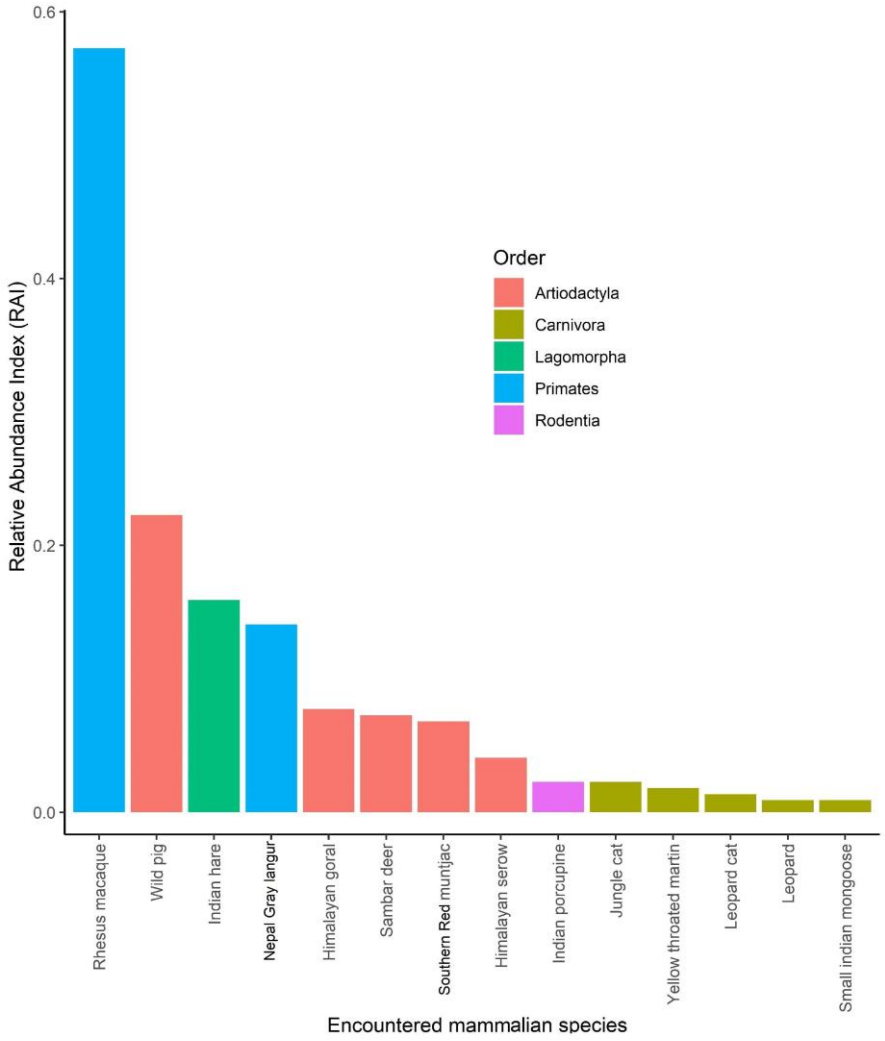


Figure 12: Relative Abundance Index of encountered mammalian species during camera trapping.

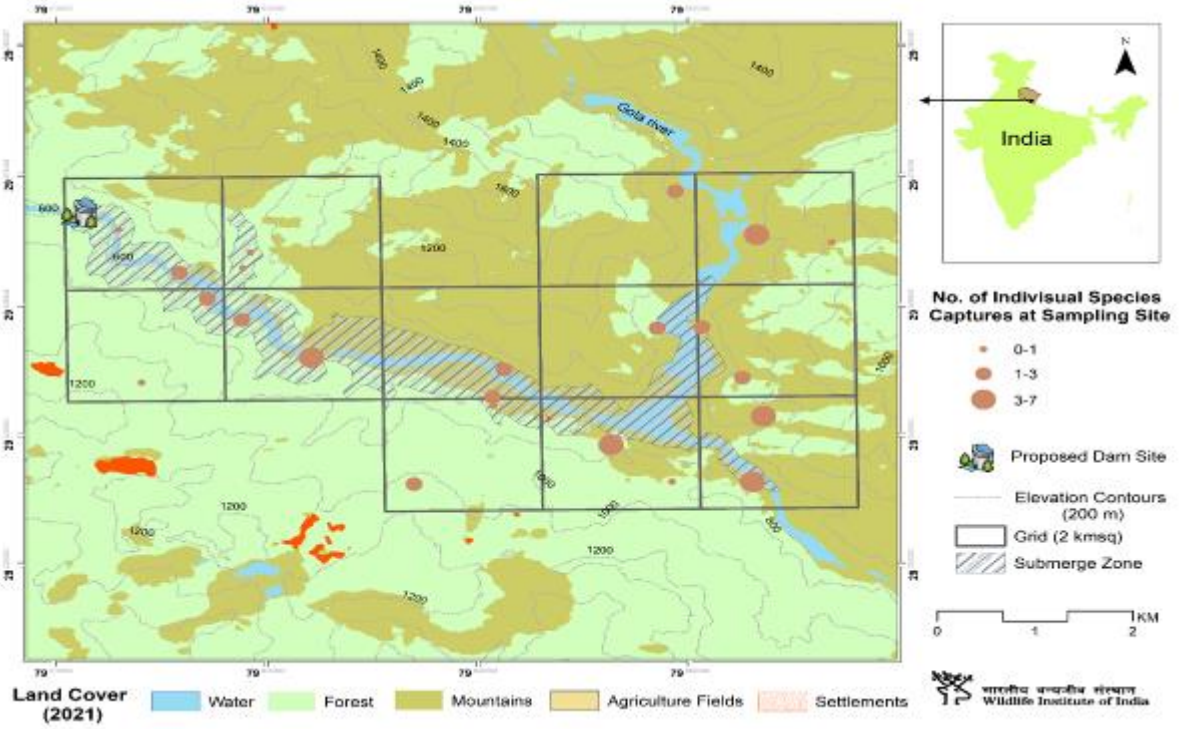


Figure 13: Number of individual species captured at camera trap locations

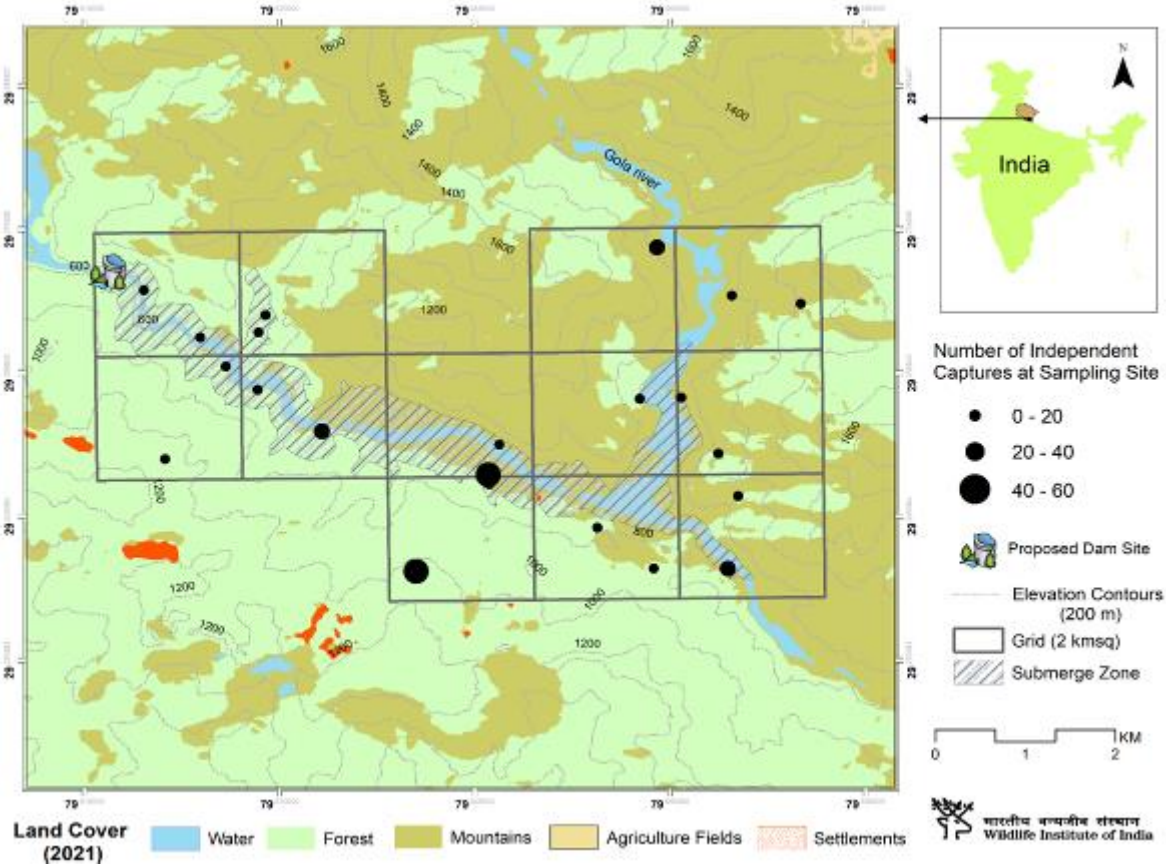


Figure 14: No. of Independent Captures at Camera Trap Locations.

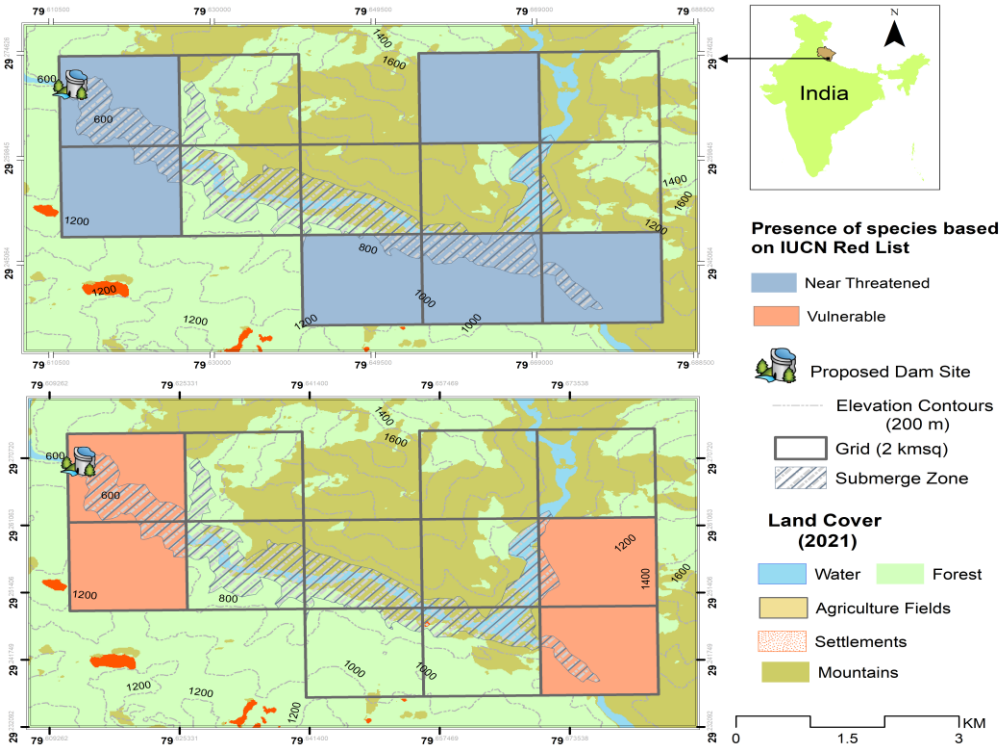


Figure 15: Status of mammalian species based on IUCN Red list at camera trap locations

5.5 Discussion on findings from the rapid camera trapping survey in the study area:

The camera trapping study conducted upstream and downstream of the proposed Jamrani Dam provided valuable insights into the local fauna and their potential response to the dam's construction. The results indicated the presence of a diverse range of wildlife species, with some species having high conservation significance and threat according to the IUCN Red List.

Two species, the Leopard *Panthera pardus* and the Sambar deer *Rusa unicolor*, were classified as vulnerable according to the IUCN Red List. This classification highlights the importance of considering their conservation during the planning and implementation of the dam project. The presence of these vulnerable species suggests that the dam's construction may have direct or indirect impacts on their populations. Further investigations and appropriate mitigation measures should be implemented to minimize any negative consequences on these species.

The Himalayan serow and the Himalayan goral were categorized as near threatened. Although they are not currently classified as endangered, their populations face significant threats and are declining. The detection of these species in the study area emphasizes the need to carefully consider their habitats and movement patterns during dam construction. Adequate measures should be implemented to mitigate any potential disruptions to their habitats and ecological corridors.

The majority of the identified species were classified as least concern in the IUCN Red List, indicating that they are not currently facing significant threats to their populations. However,

their presence in the study area highlights the ecological importance of the region and the need to preserve their habitats. Even species classified as least concern can be affected by alterations in their habitats, such as changes in water availability or quality resulting from the dam's construction. Monitoring these species throughout the project and implementing appropriate conservation measures will help ensure their long-term survival. The RAI provides an estimation of the abundance of each species in the study area. The RAI values obtained for the different species can help assess their population densities and distributions. These values can serve as baselines for future monitoring efforts, allowing for the evaluation of any changes in population abundance or distribution patterns after the dam's construction. The camera trapping study also provided important data on the locations where animals were captured. This information can be used to identify critical habitats and movement corridors used by the wildlife in the study area. It is crucial to consider these areas during the dam construction phase to minimize disturbances to key habitats and ensure the continuity of wildlife movement.

Based on the findings of this study, it is evident that the proposed Jamrani dam has the potential to impact the local fauna in the Gola River region. The presence of Vulnerable and Near-threatened species emphasizes the importance of incorporating appropriate mitigation measures into the dam construction plans. Environmental impact assessments should be conducted to evaluate potential impacts on wildlife populations, their habitats, and ecological connectivity. These assessments should guide the design and implementation of mitigation strategies to minimize adverse effects and promote the conservation of the local fauna. Additionally, long-term monitoring programs should be established to assess the post-construction impacts on wildlife populations. Regular monitoring of population dynamics, behavior, and distribution patterns will help identify any changes and allow for adaptive management strategies to be implemented if necessary.

In conclusion, the camera trapping study conducted upstream and downstream of the proposed Jamrani dam provides valuable information on the local fauna and their potential response to the dam's construction. The presence of vulnerable and near-threatened species highlight the need for careful consideration of their habitats and the implementation of appropriate mitigation measures. By integrating these findings into the dam's design and management plans, it is possible to minimize negative impacts on wildlife populations and their habitats while ensuring the sustainable development of the region.

6. Assessing tiger and elephant presence in and around the Jamrani project site using data from All India Tiger Estimation (AITE) 2022:

The data from census surveys conducted in year 2018, 2014, and 2010 provide confirmation of the presence of tigers in the landscape (figure 17). From the AITE assessment, camera trap tiger captures were recorded in within 10 km in 2018 and within 15 km of distance in 2022 from the project site. Additionally, Chital *Axis axis* have been observed in the area, and other schedule I wildlife species (WPA 1972) such as elephants, Indian grey wolf, sloth bear and golden jackals, which have been detected in the nearby regions outside the project area. The presence of carnivore species is depicted at 100 sq.km grid size and of herbivores at 25 sq.km grids based on the sign survey sampling. During the sign survey sampling, various types of signs or indicators that suggest the presence of species were pugmarks, scats, scrape marks,

etc. The grids with the evidence of species presence are recorded as “present”. The presence of tigers in the landscape is evident based on census data from various years. This information highlights the significance of the tiger and leopard population in the area and emphasizes the importance of preserving their habitat and ensuring their conservation.

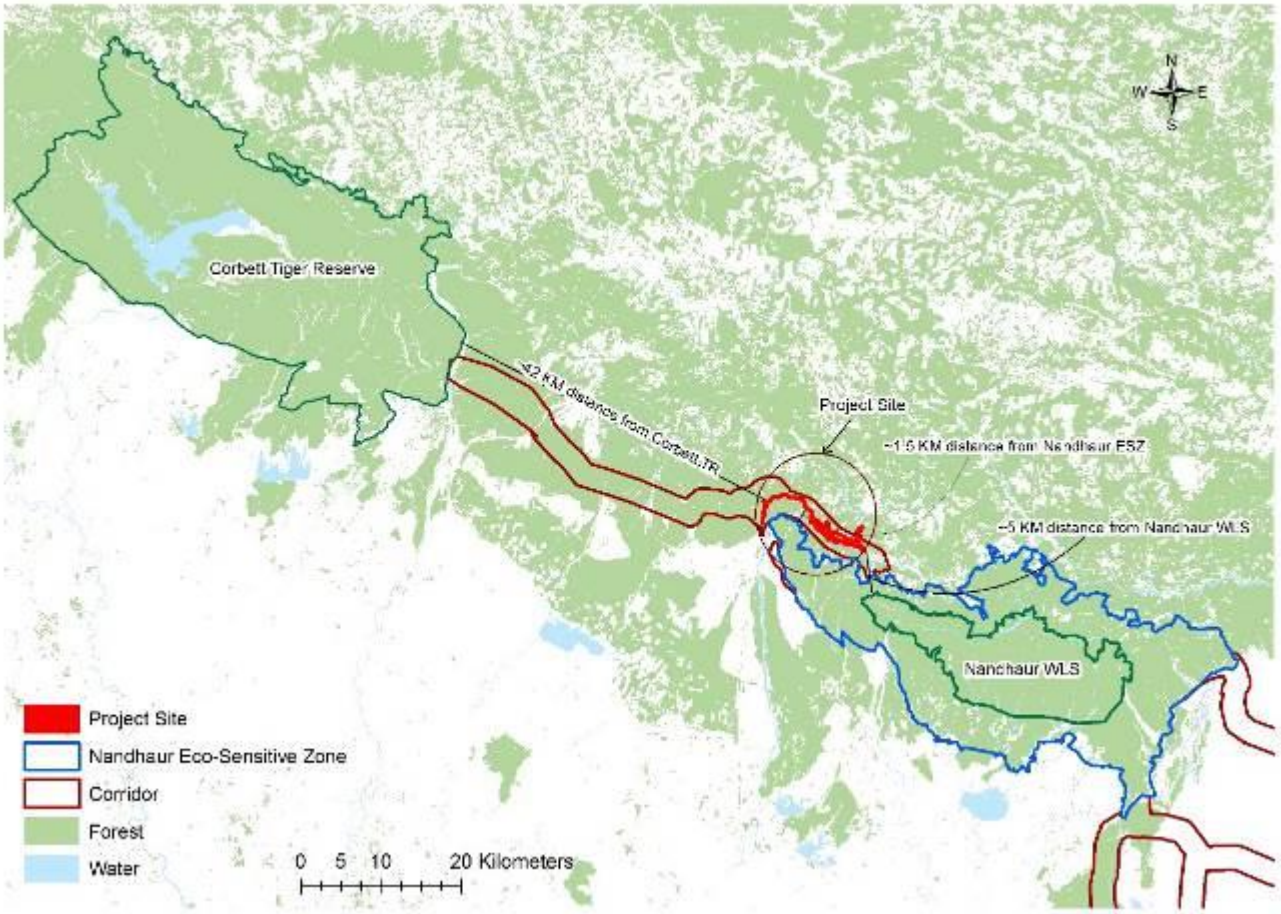


Figure 16: Map showing the proposed project site located within the forest division of Nainital district, located near to Nandhaur Wildlife Sanctuary (~5 km from its boundary and ~1.5 km from its ecologically sensitive zone) and Corbett Tiger Reserve (42 km away).

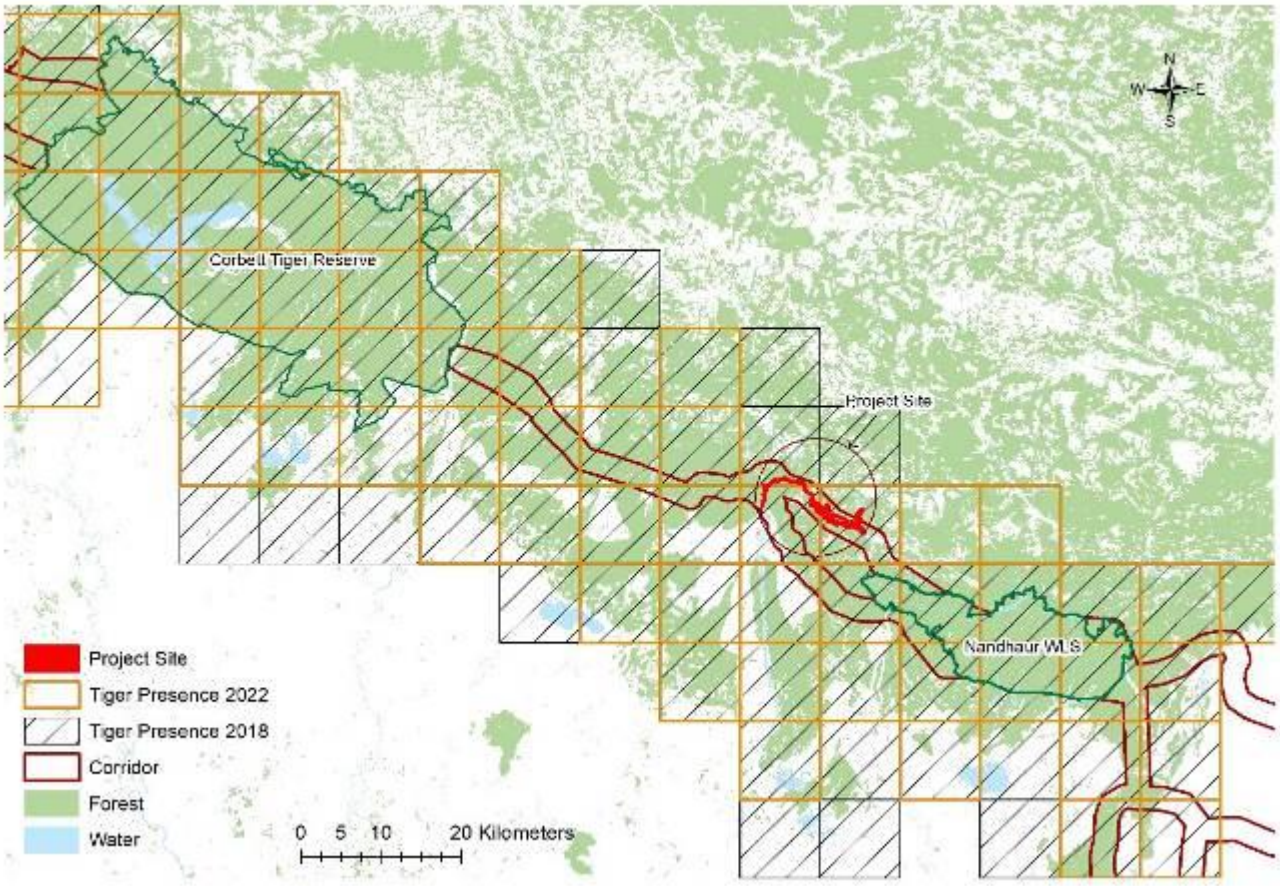


Figure 17: Map showing the recorded presence of tigers in the landscape (AITE, 2018 & 2022)

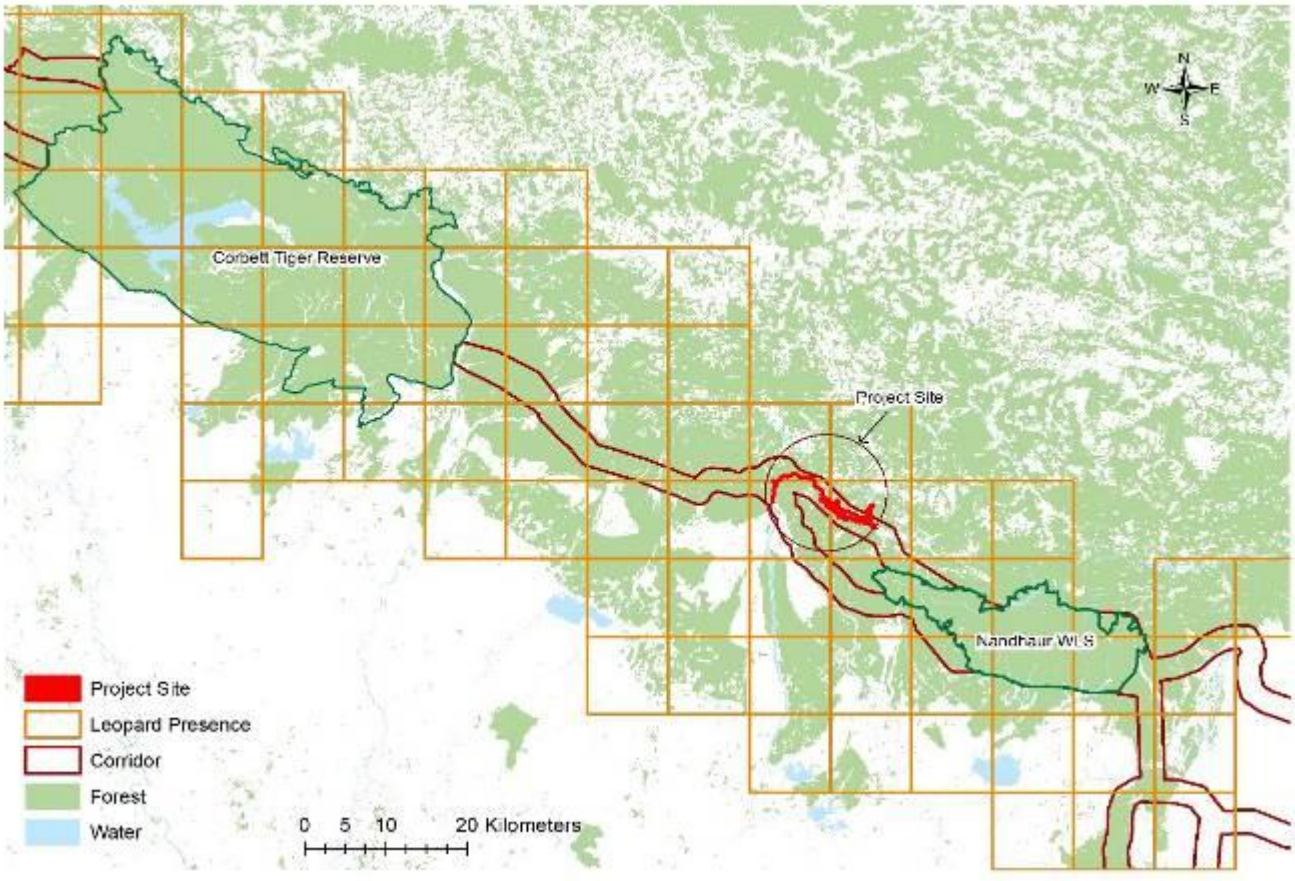


Figure 18: Map showing the recorded presence of leopard in the landscape (AITE, 2022)

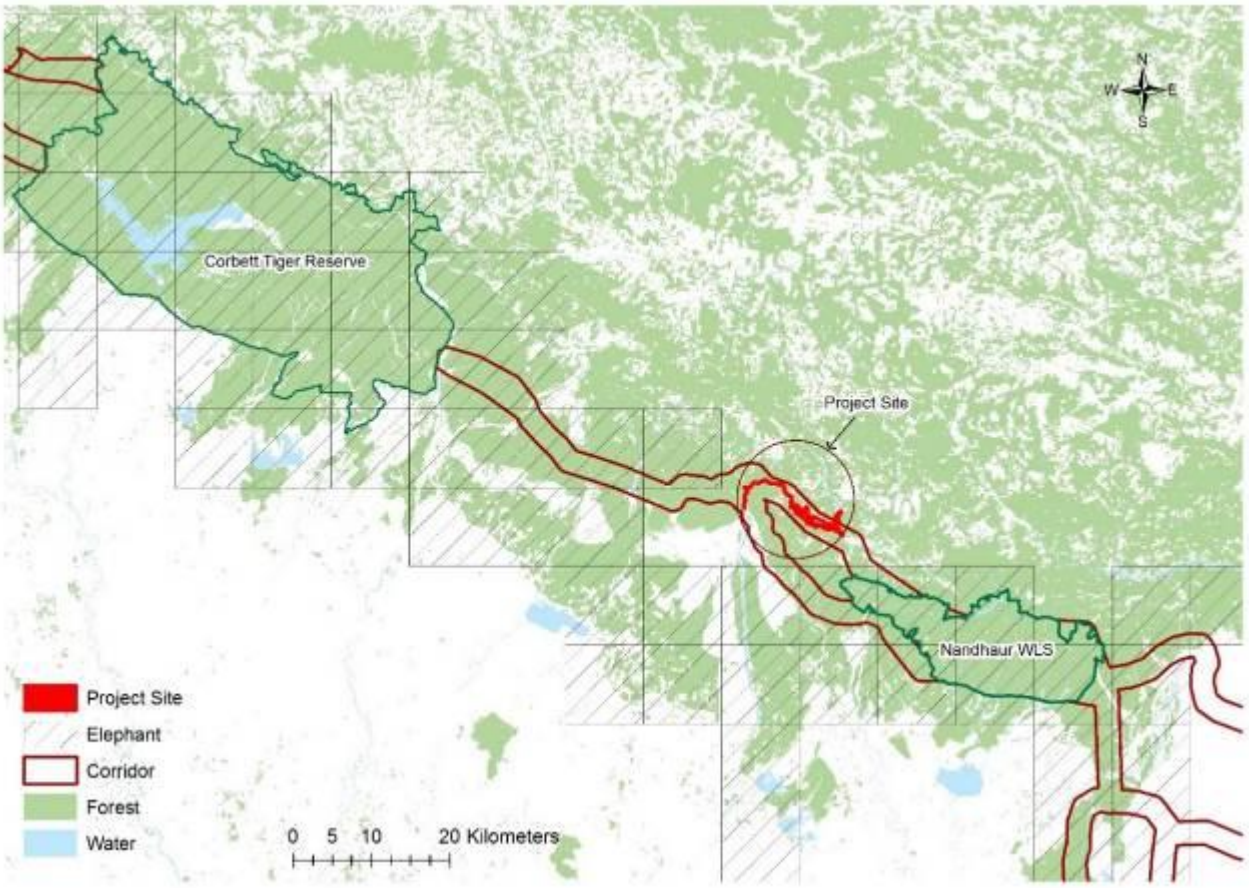


Figure 19: Map showing the recorded presence of elephant in the landscape (AITE, 2022)

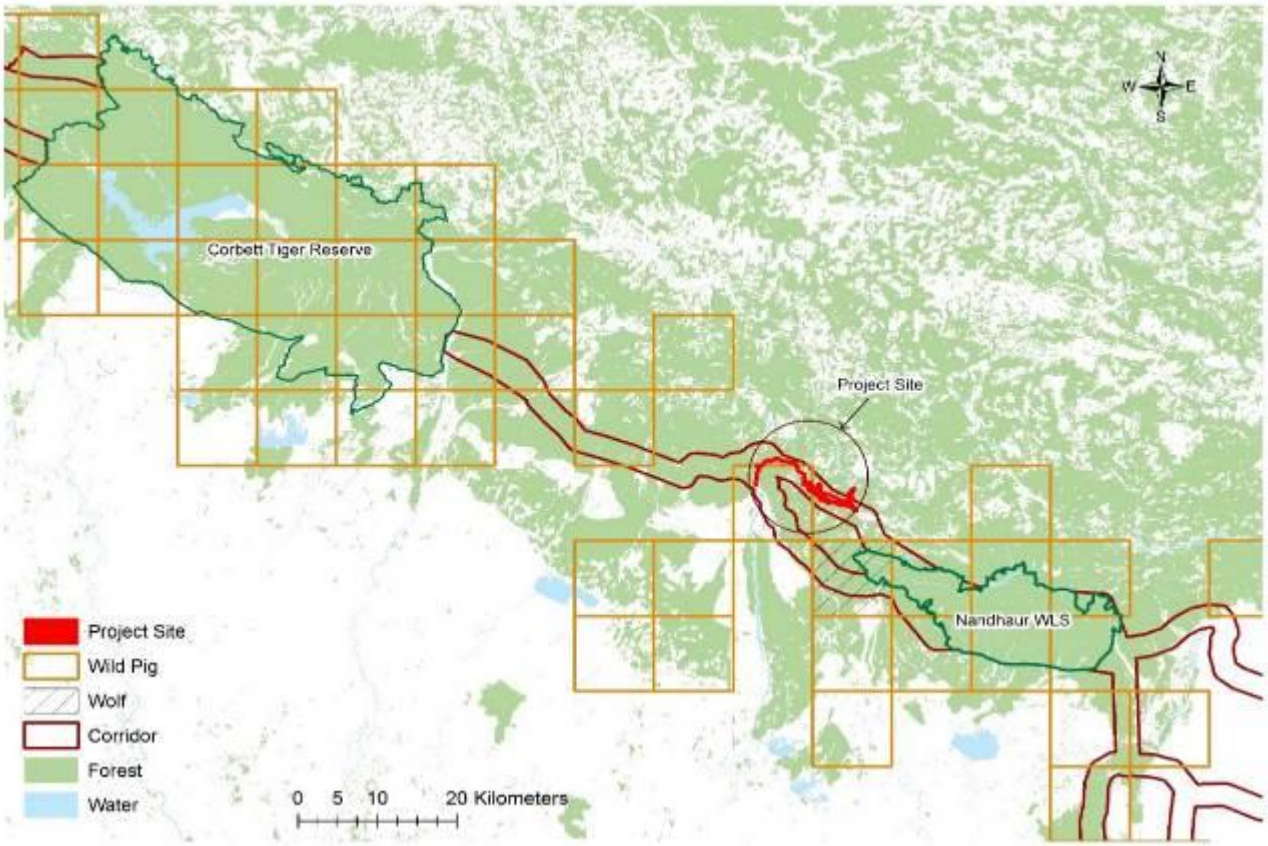


Figure 20: Map showing the recorded presence of wild pig and wolf in the landscape (AITE, 2022)

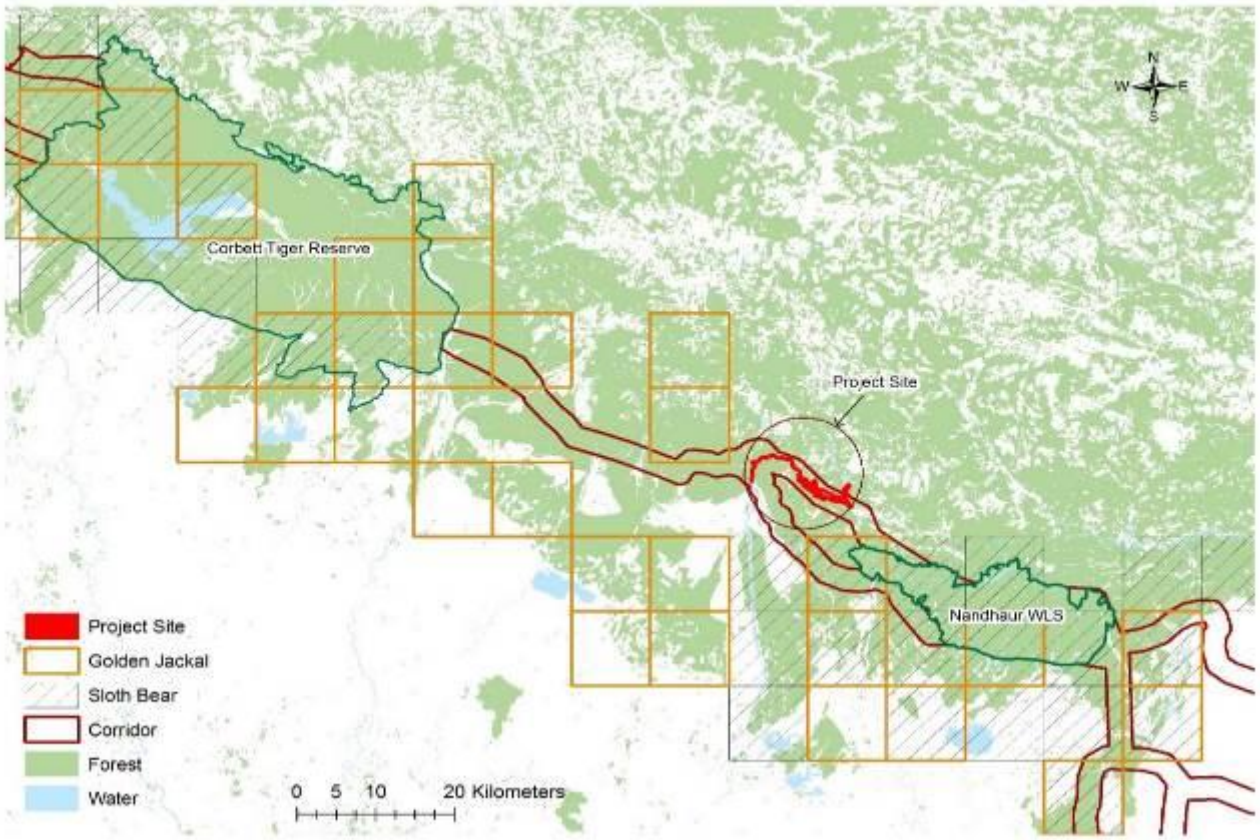


Figure 21: Map showing the recorded presence of golden jackal & sloth bear in the landscape (AITE, 2022)

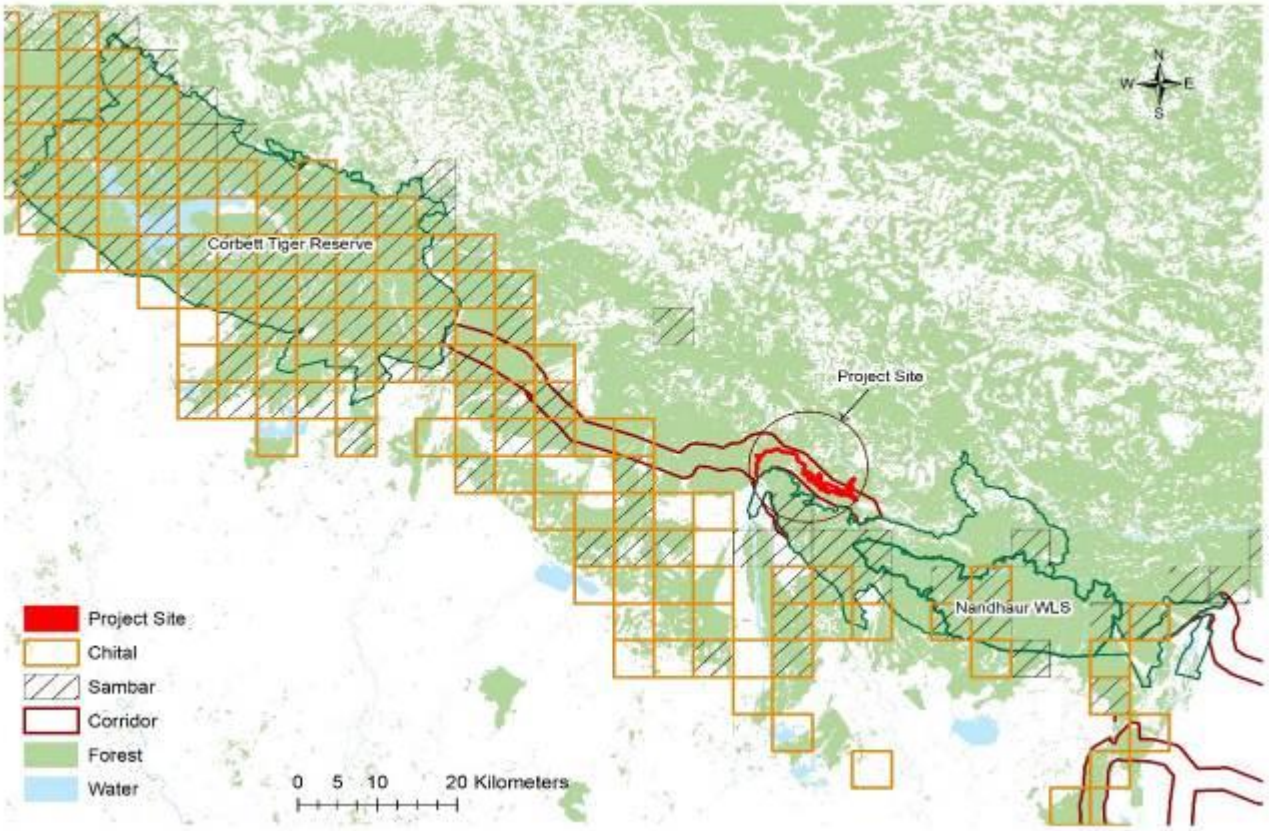


Figure 22: Map showing the recorded presence of Chital and Sambar in the landscape (AITE, 2022)

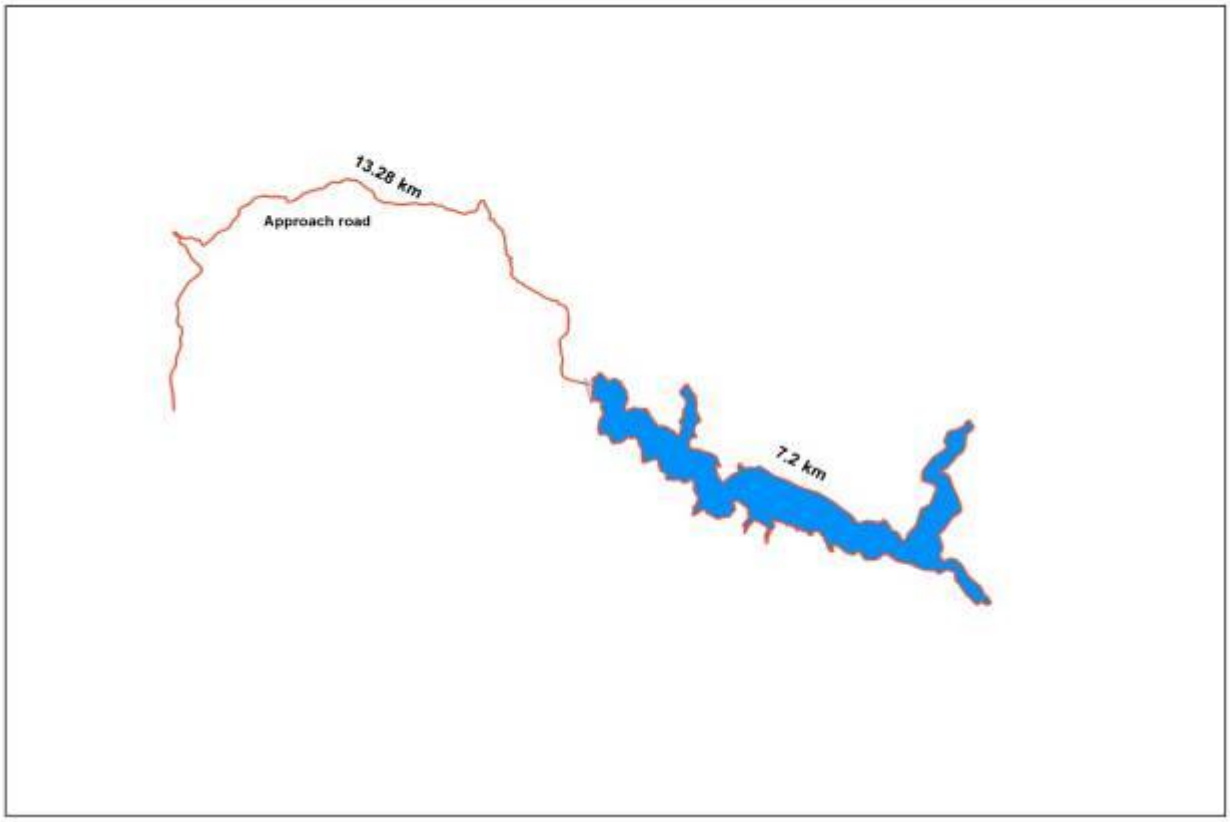


Figure 23: Map showing the length of the submergence area.

Impact of the project at landscape level: The proposed project site is situated within the forest division of Nainital district. The site holds significant importance as a wildlife habitat and is located near to Nandhaur Wildlife Sanctuary, with a distance of approximately ~5 km from its boundary and falls in the close proximity of 1.5 km from ecologically sensitive zone (ESZ) of the sanctuary (figure 16). The project site is situated 42 km away from the Corbett Tiger Reserve, which currently harbours 231 tigers (AITE 2018) serving as a major source population in the landscape. This project's implementation would severely disrupt the crucial connectivity between Corbett TRs and Nandhaur Wildlife Sanctuary, as well as other forested habitats in the further east with other populations of tigers in Uttar Pradesh (Dudhwa, Pilibhit Tiger Reserves) and Nepal (Suklaphanta and Bardia National Parks) in the Terai. This likely to undermine transboundary tiger conservation initiatives by compromising potential for tiger dispersal across landscape. Moreover, the adverse effects on forest contiguity, hydrology and drainage networks, distribution and behavior of other endangered flora and fauna in the area, impact on microclimate are some of the major irreversible impacts envisaged from implementing this project.

The tiger corridor on which the project is proposed has several bottlenecks across river Gola and is already severely impacted by urban sprawl of Haldwani township, mining and various human activities along with NH 87 and the railway track to Kathgodam. The proposed project would affect approximately 24 km^2 area and cause submergence of approximately 4.28 km^2 area of the tiger corridor. Although the extent of submergence may appear less, it will fragment the corridor landscape and the impact of the proposed dam and associated infrastructures is likely to be cumulative which might alter the traditional dispersal routes of

tigers, elephants and other wildlife, thereby escalating conflicts. Implementation of the project will undeniably alter the land use pattern in the landscape by changing cropping patterns. Moreover, as envisioned, the project will come up with many additional revenue generation activities such as fisheries, tourism etc. Irrefutable ecological impacts of these in future are beyond prediction with current understanding and information and should be considered cumulatively.

It is, therefore, essential to implement robust mitigation measures in case the project is deemed unavoidable, as the completed project would permanently destroy the corridor connectivity and alter land use pattern.

7. REVIEW OF CONSERVATION AND MANAGEMENT PLANS

In 2019, the Uttarakhand Irrigation Department (Project Proponent), formulated a comprehensive Wildlife Conservation Plan for the Jamrani Drinking Water Multipurpose Project. The primary objective of this plan was to safeguard the Schedule-I species as per the Wildlife Protection Act of 1972, along with other important wildlife species. Subsequently, in June 2021, the department submitted an additional document known as the Tiger Corridor Management Plan, which served as a supplement to the previously approved Wildlife Management Plan. The following sections provide an evaluation and review of these conservation plans.

7.1 Wildlife Management Plan

The wildlife management plan is prepared for the large landscape level, including the Nainital Forest Division and the western circle, which includes five forest divisions (Terai East, Haldwani, Ramnagar, Terai Central and Terai West Forest Divisions). These forest divisions fall under the Shivalik hills and the Terai arc landscape, among the country's richest habitats for wild flora and fauna species. The major vegetation type in the landscape is the Sal forest, mixed forest, Riverine forest, Scrubland, Grassland (Savannah) and Subtropical pine forest. Among the wild fauna, Barking Deer, Sambar, Goral, Wild pig, Chital, Elephant, Sloth beer, Asiatic Black Bear, Bengal tiger, Leopard, Indian Pangolin, Rock python, King cobra etc. species are found in the landscape. A detailed description of the background on the previous forest management and conservation practices, present status and important issues, key species, species-specific habitat management, weed management techniques, major threats, protection strengthening, Wildlife health management, plantation, water management, human-wildlife conflict etc. in the region to the wildlife are discussed in the wildlife management plan.

The Nandhaur wildlife sanctuary is the closest protected area and the proposed dam site is located approximately 6 km and 2 km of aerial distance from the sanctuary and its eco-sensitive zone, respectively. The sanctuary also comes between the Corbett-Lagga-Dudhwa corridor. Chapter 10 of the wildlife management plan is about corridor connectivity management. That describes that the Nandhaur region, spanning approximately 1500 sq.km, encompasses a significant tiger habitat; however, it is reported to have a fragile connection with other forests where tigers reside. This limited connectivity is likely responsible for the impact on Nandhaur's carnivore population, which starkly contrasts the uninterrupted Rajaji - Corbett - Ramnagar forest block, as evidenced in Harihar *et al*. (2012).

The operational functionality of corridors in the Nandhaur region can be confidently established based on photographic evidence capturing tiger movement. Extensive surveys conducted in the Boom-Bramhadev corridor along the Sharda River that delineates the India-Nepal border provided compelling evidence of a well-established connection between the Nandhaur region and the Bramhadev forests. It was observed that animals could freely traverse a few kilometres upstream from Tanakpur without encountering human-made obstructions. However, the northward expansion of residential and agricultural areas along the west bank of the Sharda River from Tanakpur has reportedly affected an elephant corridor.

Mann *et al*. (2013) suggested that boulder mining is currently limited to the Sharda riverbed downstream of the Tanakpur barrage. However, if this activity expands upstream into other areas such as Kiroda and Kalonianala, it would significantly encroach upon the habitat of tigers, leopards, bears, elephants, and other wildlife that frequently utilize these drainage systems. Although no reliable information is available on the mammal status in the Bramhadev forests, which are connected to the Shuklaphanta Wildlife Reserve in Nepal, it is unlikely that the region currently supports a substantial resident tiger population.

The upper Gola river corridor, situated beyond Kathgodam town, has undergone significant development in recent years. This development can be attributed to the increasing human populations in the villages along the river and the amplified traffic volume on the Haldwani-Nainital highway.

S.No.	Details of Work	I yr	II yr	III yr	IV yr	V yr	VI yr	VII yr	VIII yr	IX yr	X yr	Total
1	Human Wildlife Conflict Mitigation	118.9	123.4	126.4	134.8	22.8	7.2	7.2	7.55	7.55	7.75	563.55
2	Strengthening of Wild Life infrastructure and Protection	98.96	101.96	96.16	82.26	45.3	43.81	45.36	44.36	44.36	45.61	648.14
3	Forest Fire Control and Management	5.86	5.86	5.86	5.86	5.86	5.86	5.86	5.86	5.86	5.86	58.6
4	Wild Life Habitat Improvement & Management	20.7	20.7	20.8	20.8	26.5	23	23.4	23.4	23.4	23.75	226.45
5	Wild Life Health and Veterinary Management infrastructure to be developed at Haldwani Zoo	24.5	14.5	15	15	15.5	10.5	11	11	11	11.5	139.5

6	Wildlife Awareness & Human Resource Development	1.S	1.S	1.5	1.5	1.5	1.5	1.S	1.S	1.5	1.5	15
7	Wildlife Research/study & monitoring	3.6	3.6	3.6	3.6	3	3	3	3.5	3.5	4	34.4
8	River Training Soil & water Conservation Works	2	2	2	2	2.5	2.5	2.S	2.S	2.5	2.5	29
9	Publication, Documentation And Database Management	10.8	10.8	11.92	11.92	12.05	12.85	12.96	12.96	13.8	13.8	123.86
10	Tourism Regulation, Interpretation and Nature Education	52	7	7	7	7.5	7.5	7.5	7.5	7.5	7.5	118
11	Administrative, Legal and other expenses related to wild life Conservation	2	2	2	2	2	2	2	2	2	2	20
	Total	340.82	293.32	292.24	286.74	144.51	119.72	122.28	122.13	122.97	125.77	1970.5

Table 5. Budget proposals for 10 years plan for Wildlife Conservation Plan under Jamrani Drinking Water Multipurpose Project, Nainital, Uttarakhand, India. (Amount in Lakhs)

7.2 Tiger Corridor Management Plan

This tiger corridor management plan is part of the wildlife clearance proposal to obtain NOC from NTCA. After obtaining clearance, this plan is set to be integrated into the pre-existing wildlife conservation plan, accompanied by additional financial support. Potential Habitat Connectivity/corridor for Tiger movement between Corbett- Dudhwa was shown in one WII report (Qureshi *et al*., 2014), and one branch of this corridor passes through the dam submergence area. It is also reported that the frequency of using this corridor is extremely low due to the increasing human population pressure and topography.

Impacts of the Proposed Project on Corridor are given below.

i) Potential Habitat Connectivity/corridor for Tiger movement between Corbett- Dudhwa was shown in one of the WII report.
ii) There are two branches of the same tiger corridor passing near the proposed project area. However, only one branch (Upper/north Branch) will be partially affected due to creation of dam submergence area. Other branches (Lower/ South Branch) passing through dense forest area will remain unaffected from the proposed project.
iii) Considering the width and length of the corridor (Upper/north Branch), a total 24 sq.km area of the corridor is coming along the project area. However, the proposed project will

affect the total submergence area of the proposed reservoir, which is only 4.28 sq.km (i.e. only 17.85%). This 17.85% of the area will be affected at the full reservoir level. However, this affected area will reduce further when the water level comes down in different seasons. A lot of space for corridor area is also available on both sides of reservoir boundaries. A minimum of 950 meters from the left bank of Gola River and 700 meters from the right bank of Gola River space will still be available for animal movement.

iv) In monsoon months, this corridor above to Lugar stream confluence point will also be affected due to the filling of the reservoir at FRL (Full Reservoir Level). However, out of the 12 months, this will happen only in monsoon season and for almost 8-9 months, corridor will remain un-fragmented, and animals can easily pass through the corridor.

In monsoon (June-to September) 17.85%, in Non-Monsoon / Non-lean Season (October-January) 12.50% and in Lean season (February-May) 8.78% of the corridor area will be submerged.

7.2.1 Plan of action for habitat improvement / plantation and buffer area development at affected corridor branch

- Marking of buffer area that is to be created along the submergence area up to the 1.5 km distance at right side and 1.0 km distance at left side from the existing corridor boundary to compensate the loss of the affected corridor by using satellite images.
- Identify the denuded patches and area within the corridor and in buffer area.
- Plantation of native plant species in identified areas and patches including maintenance for 10 years.
- Creation of bridle path 6-8 feet wide, for facilitating wild animal movement, all along the corridor length on both sides of the submergence area.
- Reduction of anthropogenic pressures on habitats/corridor.
- Strengthening of Perimeter plantation and grassland development
- Removal of invasive species/lantana and native species plantation and maintenance.
- Depending upon topographical conditions and requirement, small water bodies may also be created in corridor buffer area.

Approximate Cost - Rs. 100 lacs (this is an additional fund to the item No. 4 of main wildlife conservation plan)

7.2.2 Plan of action for placing fence at strategic locations to avoid accidental drowning of animals

- Identification of areas of frequent animal movement (diurnal activity) and steep gradients (>45°).
- Provide fencing in identified areas to avoid accidental drowning.
- Iron fencing is proposed in right bank of reservoir while Bio fencing or bamboo plantation is proposed in left bank.

Approximate cost - 80 Lacs.

7.2.3 Development of Watch tower/Chowki and Wildlife Conflict Management (50.0L)

7.2.4 Installation of Camera Trap and monitoring of animal movement in the corridor (20.0L).

7.2.5 Forest Fire Control and Management specific to corridor area (20.0L).

Table 6: Cost of Corridor Management Plan

Sr. no.	Management Measures	Cost (Lacs)
1	Habitat improvement/Plantation and buffer Area Development at Affected Corridor Branch	100.0
2	Placing of fence at strategic locations to avoid accidental drowning of animals	80.0
3	Development of Watch tower/Chowki and Wildlife Conflict Management	50.0
4	Installation of Camera Trap and monitoring of animal movement in the corridor	20.0
5	Forest Fire Control and Management specific to corridor area	20.0
	Total	Rs. 270 Lacs (2.70 Cr)

8. Recommendation:

As this report is to facilitate and guide informed decision making by the NTCA, we present two decision making scenarios with differing objectives:

(i) Keeping the Dudwa-Lagga Tiger Corridor intact and conserving this as utmost importance:

Mitigation is not a panacea that will overcome all ill effects of developmental projects. In fact, avoidance is also considered as the very first mitigation step/ measure. Despite all technological and scientific developments, our understanding of complex natural processes in the Terai landscape which has taken millions of years to evolve, is still primitive and far from complete and therefore many other impacts of the project on the natural systems may remain unforeseen as of today. The best mitigation measure for the project is avoidance of any developmental project in the identified Tiger Corridor Area. The total submergence area of the proposed reservoir, is 4.28 sq.km (i.e. about 17.85% of the corridor area of 24 sq.km). This 17.85% of the area will be affected at the full reservoir level. If we have to save this area without any anthropogenic intervention, the area has to be left alone and status-quo has to be maintained without any developmental activities in the corridor.

(ii) Balancing the interests of both development and conservation values:

If this MPP is unavoidable due to other considerations and has to be approved, then mitigation measures proposed in both the Tiger Conservation Plan and in Wildlife Management Plan has to be undertaken. A regular and transparent monitoring of compliance conditions has to be in place, hence an independent committee comprising of members from NTCA, WII, FRI/ICFRE, State FD may be constituted to oversee the implementation of mitigation measures on a half yearly basis and submit their report to NTCA for strict compliance by the project proponent.

The activities proposed in the Tiger Corridor Conservation Plan is inadequate. A long term study should be commissioned to regularly monitor for the wildlife in the corridor both during the construction and 5 years after commissioning of the project. These 10 yearlong studies must be carried out by a reputed Institutions with domain knowledge and expertise with fund support from the User Agency.

The habitat improvement/plantation and Buffer Area Development at Affected Corridor Branch (Upper-North Branch) especially above the submergence area, is the most crucial activity and is under budgeted. Exact areas of this plantation, duration of the plantation, tree species to be used in the plantation, maintenance schedule has to be developed by the UA and this plan has to be approved by the FD. As the plantations will take time to establish successfully, regular monitoring of this activity is required and the committee as proposed can monitor this activity.

As far as the elephant occurrence and movement in the areas is concerned, the AICTE (2022) has not recorded any evidence in the project area and local officials, local people also endorsed that elephant occurrence and movement is evident outside the project area and not in the proposed dam and submergence area. However, with elephants being long-ranging species, their colonization of the project site at any time cannot be ruled out.

9. REFERENCES

Abernethy, C. S., Amidan, B. G., & Cada, G. F. (2001). *Laboratory studies of the effects of pressure and dissolved gas supersaturation on turbine-passed fish* (No. PNNL-13470). Pacific Northwest National Lab., Richland, WA (US).

Agostinho, C. S., Pereira, C. R., Oliveira, R. J. D., Freitas, I. S., & Marques, E. E. (2007). *Movements through a fish ladder: temporal patterns and motivations to move upstream*. Neotropical Ichthyology, 5, 161-167.

Andriolo, A., Piovezan, U., Costa, M. J., Torres, H. A., Vogliotti, A., Zerbini, A. N., & Duarte, J. (2013). *Severe population decline of marsh deer, Blastocerus dichotomus (Cetartiodactyla: Cervidae), a threatened species, caused by flooding related to a hydroelectric power plant*. Zoologia (Curitiba), 30, 630-638.

Baird, I. G., Silvano, R. A., Parlee, B., Poesch, M., Maclean, B., Napoleon, A., & Hallwass, G. (2021). *The downstream impacts of hydropower dams and indigenous and local knowledge: Examples from the Peace–Athabasca, Mekong, and Amazon*. Environmental Management, 67, 682-696.

Beck, M. W., Claassen, A. H., & Hundt, P. J. (2012). *Environmental and livelihood impacts of dams: common lessons across development gradients that challenge sustainability*. International journal of river basin management, 10(1), 73-92.

Bodaly RA et al. (2004). *Experimenting with hydroelectric reservoirs*. Environ Sci Technol 38:347A–352A

Bunn, S. E., & Arthington, A. H. (2002). *Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity*. Environmental management, 30, 492-507.

Cauchois, A., L'Hostis, M., & Mohan, M. (2022). The Development of Jamrani Multipurpose Project in India from a multilateral development bank perspective. In *E3S Web of Conferences* (Vol. 346, p. 01017). EDP Sciences.

Dangwal, L. R., Rawat, Y. S., & Todaria, N. P. (2014). Composition and structure of chir pine (Pinus roxburghii) forests of Nainital, Western Himalaya, India. Tropical Ecology, 55(1), 115-126.

Debata, S., & Swain, K. K. (2018). Estimating mammalian diversity and relative abundance using camera traps in a tropical deciduous forest of Kuldiha Wildlife Sanctuary, eastern India. Mammal Study, 43, 45-53. DOI: 10.3106/ms2017-0078

Dugan, P. J., Barlow, C., Agostinho, A. A., Baran, E., Cada, G. F., Chen, D., & Winemiller, K. O. (2010). *Fish migration, dams, and loss of ecosystem services in the Mekong basin*. Ambio, 39, 344-348.

Gairola, S., Rawat, Y. S., & Todaria, N. P. (2011). Floristic diversity in sub-tropical pine forest of Nainital, Western Himalaya. Journal of Forestry Research, 22(4), 537-544.

Goldsmith, E., & Hilyard, N. (1984). *Social and Environmental Effects of Large Dam*. Wadebridge Ecological Centre, Cornwall.

Guo, W., Cao, G., & Quan, R.-C. (2017). Population dynamics and space use of wild boar in a tropical forest, Southwest China. Global Ecology & Conservation, 11, 115-124.

Hall, B. D., Louis, V. S., Rolfhus, K. R., Bodaly, R. A., Beaty, K. G., Paterson, M. J., & Cherewyk, K. P. (2005). *Impacts of reservoir creation on the biogeochemical cycling of methyl mercury and total mercury in boreal upland forests*. Ecosystems, 8, 248-266.

Harihar, A., & Pandav, B. (2012). Influence of connectivity, wild prey and disturbance on occupancy of tigers in the human-dominated western Terai Arc Landscape. PloS one, 7(7), e40105.

IUCN (2021). The IUCN Red List of Threatened Species. Version 2021-3. <www.iucnredlist.org>. Downloaded on 15 May 2023.

Jamrani Dam Construction Division-1 (2009). EIA Report of Jamrani Dam Multipurpose Project. Irrigation Department, Kathgodam, Uttarakhand.

Jamrani Dam Construction Division-2 (2019). Detailed Project Report for Jamrani Dam Multipurpose Project. Irrigation Department, Kathgodam, Uttarakhand.

Jamrani Dam Construction Division-1 (n.d.). Fisheries Management Plan: Environmental Management Plan Report of Jamrani Dam Multipurpose Project. Irrigation Department, Kathgodam, Uttarakhand.

Jamrani Drinking Water Multipurpose Project website: https://www.jamranidam.com

Jenks, K. E., Chanteap, P., Damrongchainarong, K., Cutter, P., Cutter, P., Redford, T., Lynam, A. J, Howard, J., & Leimgruber, P. (2011). Using relative abundance indices from camera-trapping to test wildlife conservation hypotheses—an example from KhaoYai National Park, Thailand. Tropical Conservation Science, 4, 113-131.

Luskin, M. S., Albert, W. R., & Tobler, M. W. (2017). *Sumatran tiger survival threatened by deforestation despite increasing densities in parks*. Nature Communications, 8(1), 1783.

Mann, R., Warrier, R., & Chanchani, P. (2013). Status of Tiger, Leopard and Prey in Nandhaur Valley. Baseline estimates from the sub-Himalayan Nandhaur region of Uttarakhand, India. WWF-India. Technical report. Pp 84.

McCully, P. (1996). *Silenced Rivers: The ecology and politics of large dams*. Zed Books.

Menon, V. (2014). Field Guide of Indian mammals (book).

Ohashi, H., Saito, M., Horie, R., Tsunoda, H., Noba, H., & Hishii, H. (2013). Differences in the activity pattern of the wild boar Sus scrofa related to human disturbance. European Journal of Wildlife Research, 59, 167-177.

Palmeirim, A. F., & Gibson, L. (2021). *Impacts of hydropower on the habitat of jaguars and tigers*. Communications Biology, 4(1), 1358.

Pant, S., & Samant, S. S. (2014). Ecological status and diversity of woody species in different forest types of Nainital district, Uttarakhand, India. Journal of Mountain Science, 11(1), 167-178.

Pelicice, F. M., & Agostinho, A. A. (2008). *Fish-passage facilities as ecological traps in large neotropical rivers*. Conservation biology, 22(1), 180-188.

Qureshi, Q., Saini, S., Basu, P., Gopal, R., Jhala, Y. (2014). Connecting Tiger Population for Long-term Conservation. National Tiger Conservation Authority and Wildlife Institute of India, Dehradun. Technical report 2014-2. Pp 292.

Rawat, Y. S., & Todaria, N. P. (2012). Tree diversity and stand structure of sub-tropical pine forest in Nainital, Western Himalaya, India. Current Science, 102(11), 1577-1582.

USGS EarthExplorer. Retrieved from https://earthexplorer.usgs.gov/elevation

World Commission on Dams. (2000). *Dams and development: A new framework for decision-making: The report of the world commission on dams*. Earthscan, London

Wyatt, A. B., & Baird, I. G. (2007). *Transboundary impact assessment in the Sesan River Basin: the case of the Yali Falls Dam.* Water Resources Development, 23(3), 427-442.

APPENDIX 1: Table representing the Captured mammalian species during camera trapping

Sr. no.	Grid id	Date of Deployment	Date of Retrieved	Latitude	Longitude	Elevation	Mammalian Species Captured
1	A-4-01	21-04-2023	02-05-2023	29.24391	79.66175	876	1, 5, 6,7,10
2	A-5-01	21-04-2023	02-05-2023	29.2397	79.67476	771	13, 9, 2, 11, 6, 12
3	A-5-02	22-04-2023	03-05-2023	29.24717	79.67579	890	8, 2, 6, 3
4	C-5-01	22-04-2023	03-05-2023	29.26696	79.68206	944	14,
5	C-5-02	22-04-2023	03-05-2023	29.26781	79.67517	869	13, 4, 14, 10
6	B-5-01	22-04-2023	03-05-2023	29.25154	79.67384	857	8, 9, 5
7	B-4-01	22-04-2023	03-05-2023	29.25718	79.66598	769	4, 5
8	B-5-02	22-04-2023	03-05-2023	29.25731	79.67011	762	13, 4, 7
9	B-3-01	22-04-2023	03-05-2023	29.24937	79.65085	732	10, 2
10	B-3-02	22-04-2023	03-05-2023	29.25247	79.65195	730	13, 6
11	C-1-01	23-04-2023	04-05-2023	29.26349	79.62207	657	11, 10
12	B-1-01	23-04-2023	04-05-2023	29.26052	79.62463	679	13, 5, 3
13	B-2-01	23-04-2023	04-05-2023	29.25812	79.62782	683	13, 5
14	B-2-02	23-04-2023	04-05-2023	29.25382	79.63422	698	13, 4, 5, 2, 7
15	A-3-01	23-04-2023	04-05-2023	29.24837	79.65095	727	1
16	C-4-01	23-04-2023	04-05-2023	29.27276	79.66769	802	1, 2
17	A-4-02	23-04-2023	04-05-2023	29.23971	79.66737	907	-
18	A-3-02	23-04-2023	04-05-2023	29.23943	79.64364	1168	10, 2
19	B-1-02	23-04-2023	04-05-2023	29.25096	79.61858	1157	11
20	C-1-02	24-04-2023	05-05-2023	29.26837	79.61647	649	3
21	C-2-01	24-04-2023	05-05-2023	29.26578	79.62861	715	-
22	C-2-02	24-04-2023	05-05-2023	29.26402	79.62791	697	-

Note: Himalayan Goral – 1, Nepal Grey Langur – 2, Himalayan Serow – 3, Indian Hare – 4, Southern Red Muntjac– 5, Indian Porcupine – 6, Jungle Cat – 7 Leopard – 8, Leopard Cat – 9, Rhesus Macaque – 10, Sambar Deer – 11, Small Indian Mongoose – 12, Wild Pig – 13, Yellow-throated Martin - 14

APPENDIX 2: Assistant Inspector General of Forests (FC) writes to the Principal Secretary, Forest department, Govt. of Uttarakhand approving Stage I Forest Clearance of the Central Government for the diversion of 351.55 ha of forest land for the construction of Jamrani Dam, dated 25.04.2018.

F. No. 8-36/2013-FC
Government of India
Ministry of Environment, Forests & Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi: 1100 03,
Dated: 25th April, 2018

To,
The Principal Secretary (Forest)
Government of Uttarakhand.
Dehradun.

Sub: **Diversion of 351.55 ha. (original proposed area 381.43 ha) ha of forest land in favour of Executive Engineer,Jamrani Dam Project, Irrigation Department, Government of Uttarakhand for construction of Jamrani Dam Project in District Nainital, Uttarakhand .**

Sir,

I am directed to refer to the Government of **Uttarakhand** letter No. 20/7-1-2013-300 (4160) / 2013 dated 15.04.2013 on the subject mentioned above seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government and on the basis of the recommendations of the Forest Advisory Committee, ***In-principle approval /Stage-I Clearance*** of the Central Government is hereby granted for diversion of 351.55 ha. (original proposed area 381.43 ha) ha of forest land in favour of Executive Engineer, Jamrani Dam Project, Irrigation Department, Government of Uttarakhand for construction of Jamrani Dam Project in District Nainital, Uttarakhand, subject to the following conditions:

(i) Legal status of the diverted forest land shall remain unchanged;
(i) Compensatory afforestation shall be raised over non- forest land equal to the diverted forest land. At least 1000 plants per hectare (351.55 hectares x 1000 = 351550 plants) shall be planted over identified non-forest land with provision for ten years on subsequent maintenance.
(ii) 25% of CA cost will be deposited extra by the user agency for soil and moisture conservation (SMC) activities on the CA land.
(iii) **State Government shall submit documents indicating efforts of State Government to rehabilitate 6 villages which are coming in submergence areas including Hadia khan ashram and temple.**
(iv) The land identified for the purpose of CA shall be clearly depicted on a Survey of India topo-sheet of 1:50,000 scale;
(v) The Civil Soyam land identified for raising compensatory afforestation shall be transferred and mutated in favour of the State Forest Department before issue of the Stage-II clearance and the said non-forest land as identified for raising Compensatory Afforestation shall be notified by the State Government as RF under Section-4 or PF under Section-20 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act, as the case may be, within a period of six months.

25.4.18

APPENDIX 2 (contd.)

(vi) The State Government shall provide DGPS map/shape file identify for balance plantation. The shape file may also be provided.

(vii) The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation at the current wage rate in consultation with State Forest Department in the account of Ad-hoc CAMPA of the concerned State through online portal.The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years;

(viii) The User Agency shall transfer online, the Net Present Value (NPV) of the forest land being diverted under this proposal, as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC dated 05.02.2009. The requisite funds shall be transferred through online portal into Ad-hoc CAMPA account of the State Concerned;

(ix) The approved Catchment Area Treatment (CAT) Plan shall be implemented at the cost of the user agency and commensurate funds shall be deposited through on-line in the account of Adhoc CAMPA ~~account~~;

(x) The User Agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

(xi) **The user agency should ensure that the compensatory levies (CA cost, NPV, etc.) are deposited through challan generated online on web portal and deposited in appropriate bank online only. Amount deposited through other mode will not be accepted as compliance of the Stage- I clearance;**

(xii) The Forest clearance will be for a period co terminus with the lease period specified in the lease agreement. The State Government will submit the lease agreement document specified in the lease agreement;

(xiii) The State Govt. ensure that the user agency shall implement the R&R Plan as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF &CC along with indicators for monitoring and expected observable milestones;

(xiv) The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Birds nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project.

(xv) The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS co-ordinates;

(xvi) The State Government shall complete settlement of rights, in terms of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any, on the forest land to be diverted and submit the documentary evidence as prescribed by this Ministry in its letter No. 11-9/1998-FC (pt.) dated 03.08.2009 read with 05.07.2013, in support thereof;

(xvii) The user agency shall carry out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down. The dumping area for muck disposal shall be stabilized and reclaimed by planting suitable species by the user agency at the cost of project under the supervision of State Forest Department. Retaining walls and terracing shall be carried out to hold the dumping material in place. Stabilization and reclamation of such dumping sites shall be completed before handing over the same to the State Forest Department in a time bound manner as per Plan.

(xviii) The State Government and the user agency shall ensure that the tress available between full reservoir level (FRL) and FRL+4 meters are not felled;

25.4.18

APPENDIX 2 (contd.)

(xix) The User agency shall undertake afforestation along the periphery of the reservoir;
(xx) User agency shall provide free water for the forestry related projects;
(xxi) The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;
(xxii) Any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department;
(xxiii) The layout plan of the proposal shall not be changed without the prior approval of the Central Government;
(xxiv) No labour camp shall be established on the forest land;
(xxv) The User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;
(xxvi) The user agency will abide by the applicable recommendations of the State Government including State Forest/Wildlife Departments;
(xxvii) The forest land shall not be used for any purpose other than that specified in the proposal and forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;
(xxviii) No damage to the flora and fauna of the adjoining area shall be caused;
(xxix) The User Agency shall submit the annual self - compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year;
(xxx) Any other condition that the concerned Regional Office of this Ministry may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife; and
(xxxi) The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and National Green Tribunal Order(s) pertaining to this project, if any, for the time being in force, as applicable to the project

After receipt of compliance report on fulfilment of the conditions mentioned above, the proposal shall be considered for final approval under Section-2 of the Forest (Conservation) Act, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Yours faithfully,

25.4.18

(Sandeep Sharma)
Assistant Inspector General of Forests (FC)

Copy to:

1. The Principal Chief Conservator of Forests, Government of Uttarakhand, Dehradun.
2. The Nodal officer, O/o the PCCF, Government of Uttarakhand, Dehradun.
3. Addl. PCCF, Regional Office (Central), Dehradun.
4. User Agency
5. Monitoring Cell of FC Division, MoEF&CC, New Delhi
6. Guard File.

25.4.18

(Sandeep Sharma)
Assistant Inspector General of Forests (FC)

APPENDIX 3: Minutes of the 22nd Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects held on 27.02.2019 at Teesta Meeting Hall, New Delhi.

Item No. 22.10 Jamrani Dam Multipurpose Project by Irrigation Department, Uttarakhand – Regarding reconsideration of Environmental Clearance. File No. J-12011/04/2007-IA-I & Proposal No. IA/UK/RIV/80127/2006

The Project Proponent (PP) and the Consultant, M/s Voyants Solutions Pvt. Ltd, Gurgaon, made a presentation on the project and *inter-alia*, provided the following:

Jamrani Dam Multipurpose Project envisages construction of 130.60 m high roller compacted concrete gravity dam across the river Gola, a tributary of river Ramganga, a flashy seasonal river which originates in Kumaon Himalayas and flows through south eastern Kumaon in the State of Uttarakhand, India. Jamrani MPP is proposed near village Jamrani, district Nainital, Uttarakhand 10 km upstream of existing Gola barrage which is located near Kathgodam. The catchment area at proposed dam site is 450 km². The live storage created by project is proposed to be used for drinking water, irrigation & power generation. The live storage of the project about 142.72 MCM out of which 42.7 MCM will be utilized for meeting the requirement of drinking water to Haldwani city and an additional irrigation to 57,065 ha with an incidental hydro power generation of 14 MW installed capacity with estimated annual power generation of 63.4 MU. Construction of Jamrani dam was proposed to be constructed to provide augmentation storage for Gola barrage.

In 1975, the project was accorded administrative approval by erstwhile Government of Uttar Pradesh and technically approved for Rs 61.25 crore by Planning Commission. The scheme was accepted by Advisory Committee on Irrigation, Flood Control and Multipurpose Projects for an amount of Rs. 144.84 crore in its 43rd meeting dated 18.05.1989. Gola barrage together with 40.5 km of canal system and renovation of about 244 km long canal system was completed in 1981. Revised cost based on approved designs and quantities at May, 2018 Price Level is Rs. 2584.10 Crores.

Bhabar area of Kumaon region depends entirely on Gola canal system taking off from a barrage constructed at river Gola near Kathgodam both for irrigation & drinking water. The rising demand of drinking water in Haldwani City and nearby villages is due to high population growth in the area. The water availability in lean periods decreases significantly and creates problems for large population of the area.

The river Gola is a flashy and rainfed perennial river. About 400 cumecs discharge may be expected in floods while summer discharge may reduce down to only a few cumec. Floods of moderate intensities occur with very sharp peaks & short duration. Construction of a storage reservoir is the only solution for effective utilization of water of river Gola. Storage created by construction a dam upstream of Gola barrage will enhance the existing irrigation system in commands of Nainital district, Uttarakhand and Rampur, Bareilly districts of Uttar Pradesh with creating an additional irrigation potential of about 57,065 ha. Accordingly, intensity of irrigation will be expected to be increased from 158.85% to 196.88%, besides providing assured supplies to the existing irrigation systems and domestic water demands for Haldwani city.

Besides additional irrigation area of 57,065 ha, 42.7 MCM for drinking water and annual power generation of 63.4 MU, there are various other indirect benefits viz. pisciculture, attraction of tourism, recharge of groundwater in adjoining area, creation of employment among the local people, infrastructure development of the area, etc. After the construction of Jamrani dam, employment opportunities and standard of living of the local people will be provided.

The baseline study for different environmental attributes was carried out in three seasons during 2006 –2007. The pollutant concentration in the air were well below the NAAQS as perm Air (Prevention & Control of Pollution) Act, 1981 dated April 11, 1994 and [EPA Notification: GSR 176 (E), April 2, 1996. The noise monitoring shows that L_{eq} (noise level equivalent) day and night time noise levels were within the standards. The analysis of ground water indicates that the pH is within limit. The total hardness, TDS values in all water samples

was well below the permissible limit specified for drinking water purpose. The fluorides level was much lower than the permissible limit for drinking purposes. The BOD and COD values were also very low indicating absence of organic pollution loading. During the survey conducted, no threatened/endangered species (IUCN-Vulnerable category) had been recorded around the dam site within (10 km radius). During the survey, no fish species was observed in the upstream of Khinchi Gola and Lugar stream and downstream of Barajalla stream. On the basis of different fish catch or visual observation made during survey, none of the fish recorded are listed under Indian Wildlife Act, 1972 and IUCN (2006).

The Public Hearing for the above mentioned project was held on 12.05.2008 near Field School situated in village Damuadunga, Tehsil Haldwani which is approximately 3 km away from the Kathgodam Railway Station. The meeting was presided by Upper collector, Nanital and Organized by Uttarakhand State Pollution Control Board, Dehradun. The public notice was advertised in the local newspaper for the commencement of the Public hearing dated 10th April, 2008 Wide publicity was also carried out in the villages falling under project zone. The public hearing was attended by villagers and the representative of affected Gram Panchayat. 124 stake holders marked their presence in the meeting. The main issues raised during Public Hearing were regarding the compensation against land acquisition and supply of clear water.

Hydrology has been approved by Hydrology (North) Directorate, CWC, New Delhi vide letter No. Hydrology (N) Dte. / 1 / UP/ 218/ 83/ 106-07, dated 01.03.2011. The main features of Hydrology of the project are:

Catchment area up to dam site - 450 km^2
Annual yield at dam site in 50% DY – 393.31 MCM
Annual yield at dam site in 75% DY – 283.06 MCM
Design Flood or PMF estimated – 8427 cumecs
Rate of sedimentation – 14.29 ham/100 km^2/ year

The following approvals have been obtained till date:

a. **Irrigation Planning:** Concurrence of both the States on irrigation planning has been obtained from Ministry of Agriculture and CWC vide letter No. 2/463/IP-88/NE/ 537 dated 05.07.2012.
b. **Power Potential Studies:** Earlier, proposal of hydro power generation with installed capacity of 30 MW (3x10MW) was submitted in the DPR, 2005. After examination, CEA has approved 14 MW installed capacity for power generation from the project vide letter 207/14/2012-HPA/2821 dated 07.12.2012. The main features of the power potential studies are:

   Installed capacity: 14 MW
   FRL : 762.00 m EL
   MDDL : 717.47 m EL

c. **Dam Design:** Civil-hydel design of the dam has been approved by CWC vide letter No. 03/152/2006 - CMDD (N&W) dated 14.05.2013.
d. **Hydel Civil Design:** Hydel Civil Design of the dam has been approved by CWC vide letter No. 11/ 23/ 2012/ HCD- N & W dated 10.05.2013.
e. **Gate Design of Dam:** Gate design of the dam has been approved by Project Appraisal (North) Directorate, CWC vide letter No. 2/140/2012-PA (1063-64) dated 16.05.2013.
f. **Electro-mechanical works:** Design of electro-mechanical works has been approved by CEA vide letter No. 10/ 20/ HE & TD- 2014/ 1896-98 dated 21.11.2014.

APPENDIX 3 (contd.)

g. **Forest Clearance:** Forest Clearance has been cleared by Ministry of Environment, Forest & Climate Change vide letter No. F No. 8-36/ 2013- FC dated 25.04.2018.
h. **Inter-state matters on MOU:** Inter-state matters on MoU has been cleared by Central Water Commission vide letter No. 2/6/ ISM- 2/ 2017/189 dated 25.05.2018.
i. **Cost-Electro-Mechanical Works:** Cost of the Electro-Mechanical Works has been vetted/approved by Hydro Project Appraisal Division, Central Electricity Authority, Ministry of Power vide letter No. 207/ 14/ 2004/ HPA/ 1031 dated 06.11.2018.
j. **International clearance/ JRC angle:** International clearance/ JRC angle has been issued by Ministry of Water Resources, RD & GR (Flood Management Wing) vide letter No. Z- 23011/ 4/ 2014- Ganga (Pt- 1)/ 3675- 76 dated 29.11.2018.
k. **Cost Estimate:** The revised cost estimate of Rs. 2584.10 crores on price level May, 2018 has been approved by CWC vide letter No. 2/140/Vol-V/2012-PA(N)/437-41 dated 06.02.2019
l. **BC Ratio:** On the basis of approved cost by the CWC, the BC Ratio was finalized as 1.09 vide letter No. CWC ID No. 8/7/U.U./2004/IP(N)/38 dated 09.02.2019
m. **Environmental Clearances:** Status of Environmental Clearance-

i. **In the 35th EAC Meeting dated 18th & 19th Feb., 2010,** the Ministry of Environment, Forest and Climate Change had recommended Environmental Clearance subject to additional information which was submitted by IWC-Irrigation Department to the Ministry vide letter No. 587 IWC/R-13/ dated 20.03.2010.
ii. In absence of Forest Clearance for the diversion of forest land, EC of the Project was kept in abeyance till the decision on diversion of forest land is taken; vide MoEF's letter No. J-12011/71/2008-IA.I.
iii. Stage-I Forest Clearance (351.55 ha) for the project was obtained vide letter No. **8-36/2013-FC,** dated 25.04.2018.
iv. After obtaining Forest Clearance, a request for reconsideration for grant of EC was made by the PP vide letter No. 681/ PCH/R-13/E.I.A. dated 09.05.2018.
v. The PP was requested to upload the relevant documents for the EC application online for further reconsideration vide letter No. J-12011/71/2008-IA-I dated 20.07.2018.
vi. All the relevant documents were uploaded online on 13.02.2019 for consideration of grant Environmental Clearance.
vii. The Decision of Writ Petition (PIL) No. 138 of 2017 by the Hon'ble High Court of Uttarakhand regarding construction of Jamrani dam mentioned that ***"all the codal formalities shall be completed within a period of 3 months for Construction of Dam at the earliest".***

The EAC after detailed deliberations and considering all the facts of the project as presented by the PP, **deferred the proposa**l and sought some additional information as below:

1. One season baseline data be collected and incorporated in the EIA/EMP report for consideration of the proposal again.
2. Downstream impact due to this project up to Gaula Par village be studied.
3. E-flow be studied to ensure provision of minimum flow for the fish species particularly Mahseer and trout.
4. Periphyton composition list needs to be examined.
5. As the EIA/EMP is old, Social Impact Assessment be carried out to ascertain the need and impacts due to the project in the present context.

****

18

APPENDIX 4: Minutes of the 27th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects held on 23.09.2019 at Teesta Meeting Hall, New Delhi.

9. Since this is an expansion project where only storage reservoir is to be created on private land, some of the conditions of the standard TOR such as CAT Plan, CAD Plan, Compensatory Afforestation Plan, NCSDP approval, environment flow assessment, etc. will not be applicable.

****

Item No. 27.4 Jamrani Dam Multipurpose Project by Irrigation Department, Uttarakhand – Reconsideration of Environmental Clearance reg.

File No. J-12011/04/2007-IA-I & Proposal No. IA/UK/RIV/80127/2006

The Project Proponent (PP) and the Consultant, M/s Voyants Solutions Pvt. Ltd, Gurgaon, made a presentation on the project and *inter-alia*, provided the following:

Jamrani Dam Multipurpose Project envisages construction of 130.60 m high roller compacted concrete gravity dam across the river Gola, a tributary of river Ramganga, a flashy seasonal river which originates in Kumaon Himalayas and flows through south eastern Kumaon in the State of Uttarakhand, India. Jamrani MPP is proposed near village Jamrani, district Nainital, Uttarakhand 10 km upstream of existing Gola barrage, which is located near Kathgodam. The catchment area at proposed dam site is 450 km^2. The live storage created by project is to be used for drinking water, irrigation & power generation. The live storage of the project about 142.72 MCM out of which 42.7 MCM will be utilized for meeting the requirement of drinking water to Haldwani city and an additional irrigation to 57,065 ha with an incidental hydro power generation of 14 MW installed capacity with estimated annual power generation of 63.4 MU. Construction of Jamrani dam was to be constructed to provide augmentation storage for Gola barrage.

Jamrani Dam Multipurpose Project by Irrigation Department, Uttarakhand was earlier appraised in the 22nd meeting of the EAC held on 27.02.2019 for Environment Clearance. The EAC sought the following additional information from the PP:

1. One season baseline data be collected and incorporated in the EIA/EMP report for consideration of the proposal again.
2. Downstream impact due to this up to Gaula Par village be studied.
3. E-flow be studied to ensure provision of minimum flow for the fish species particularly Mahseer and trout.
4. Periphyton composition list needs to be examined.
5. As the EIA/EMP is very old, Social Impact Assessment be carried out to ascertain the need and impacts due to the project in the present context.

The Project Proponent (PP) and the Consultant, M/s Voyants Solutions Pvt. Ltd, Gurgaon, made a presentation on the additional information sought in this EAC meeting and *inter-alia*, provided the following:

1. One season baseline data be collected and incorporated in the EIA/EMP report for consideration of the proposal again

APPENDIX 4 (contd.)

It was informed by the PP that baseline data was earlier collected during Post-monsoon- 2006; Pre-monsoon-2007 and Post-Monsoon-2007 and Pre-Monsoon-2009. As per the recommendation of EAC in the 22nd meeting held on dated 27.02.2019, one-month additional baseline data has been collected during Pre-monsoon season (March-April 2019). Baseline data has been collected for Meteorology, Ambient Air Quality, Ambient Noise, Water Quality, Soil and Ecology and presented in the following slides. The EIA & EMP report has been updated as per the collected data of March-April-2019. A revised EIA/EMP report has also been submitted.

2. Downstream impact up to Gaula Par village

PP informed that in the lean season, scanty water is available in some stretches upstream of Gola Barrage in the river. The river becomes very thin, which does not cover the total river width. Immediately downstream of Gola Barrage except for the monsoon, there is approx. 12 km dry stretch, because of the following reason:

a) water stream disappears in the Bhabar area into permeable sediments due to porous nature of soil and
b) fresh water is used for drinking by the locals and irrigation purpose.

After construction of this project, this river stretch will not be dried up because of the following reasons:

a) Downstream of proposed dam up to existing Gola Barrage (approx. 9 km stretch) will receive environmental flow throughout the year (as per norms).
b) Additional water required for irrigation, water supply and power generation will be released through river.
c) Five (5) streams are also joining Gola river in this stretch. Thus, this stretch of river will receive water throughout the year.

3. E-flow be studied to ensure provision of minimum flow for the fish species particularly Mahseer and trout.

PP informed that the annual yield at Dam site at 75% & 50% dependable years works out to be 283.06 MCM & 393.31 MCM, respectively. At Gola barrage site, 75% dependable year work out to be 377.41 MCM. The same has been adopted for planning of the project. E-flow has been calculated for obtaining International Clearance/ JRC angle from the Ministry of Water Resources, RD & GR (Flood Management Wing) vide dated 29.11.2018.

E-flow for monsoon months from June to September has been calculated based on the average 10-daily discharge (in cumecs) (1977-78 to 2005-06). The following are the details:

S. No.	10 daily Discharge	June	July	August	September
1.	I	4.86	33.16	47.80	45.02
2.	II	4.52	30.12	45.12	41.17
3.	III	14.84	32.46	47.37	31.87
4.	Month wise average	8.073	31.913	46.783	39.353
Monsoon Season Monthly Average			31.53		
E- Flow for Monsoon			**= 30% of average = 9.459 Cumecs**		

10

APPENDIX 4 (contd.)

E-flow for lean month from January to May has been calculated based on the average 10-daily discharge (1977-78 to 2005-06)-

S. No.	10 daily Discharge	January	February	March	April	May
1	I	3.99	3.49	4.16	2.89	2.11
2	II	3.79	4.66	3.24	2.22	2.52
3	III	3.58	3.82	2.90	2.21	2.54
4	Month wise average	3.786	3.99	3.43	2.44	2.39
Lean Season Monthly Average			3.2072			
E- Flow for Lean Season			**= 20% of average = 0.641 Cumecs**			

E-flow for non-monsoon non-lean month from October to December has also been calculated based on the average 10-daily discharge (1977-78 to 2005-06)-

S. No.	10 daily Discharge	October	November	December
1	I	16.36	7.62	4.75
2	II	20.08	6.27	4.51
3	III	10.23	5.65	4.06
4	Month wise average	15.556	6.513	4.44
Non Monsoon Non Lean Monthly Average			8.836	
E- Flow for Non Monsoon – Non Lean			**= 25% of Average = 2.209 Cumecs**	

4. Periphyton composition list needs to be examined.

It was informed that a total of 20 taxa have been recorded from 7 sampling locations.

5. Social Impact Assessment.

It was informed that there are 208 Project Affected Families (PAF), of which 89 vulnerable affected families (constituting 47 BPL family & 42 Schedule Cast families). The Affected peoples will be facilitated based on their skilled and employment shall be done during construction period. Shifting of religious properties will be completed before project implementation.

Acquisition of land is through District Collector as per RFCTLARR 2013 and the R&R measures and the compensation shall be worked out strictly as per the provisions of RFCTLARR 2013. The basic facilities e.g., Irrigation, access roads, retaining wall, drainage and footpath will be constructed. Any unforeseen impacts will be mitigated as per the law

Estimation for Proposed Land Acquisition and R&R

S. No.	Item	Amount (Rs. In Lakh)
1.	Total cost of Land (A+B+C+D+E)	12,440.92
2.	Demarcation cost (1% of total) as CWC guideline	124.41
3.	Legal expenses of LA (1% of total) as CWC guideline	124.41
4.	Final Award of Land Acquisition (F+G+H)	12,689.74
5.	Cost of structure	5,153.90

11

6.	Solatium 100% on structure cost	5,153.90
7.	Total Compensation of Land Acquisition	22,997.54
8.	Total R&R Cost	1,290.39
9.	Total LA & R&R Cost	**24,287.93**
Contingency @ 15%		3643.91
Net debitable to R&R implementation programme		**27,931.12**

The Stage-I Forest Clearance (351.55 ha) for the project has been obtained vide letter No. **8-36/2013-FC,** dated 25.04.2018. EAC after detailed deliberations on the information provided by the PP, recommended for grant of EC subject to the condition that the PP would provide the following additional information to the Ministry to their satisfaction, on or before 18.10.2019:

1. The *.kml* file of the project including the muck disposal areas.
2. Muck disposal Plan as submitted is coming in the forest area should be revisited by clearly indicating the area, locations, muck holding capacity, protection measures, etc.
3. Wildlife Conservation Plan for Schedule I species, duly approved by the State Chief Wildlife Warden, to be submitted.
4. The proposed cropping pattern may be relooked in respect of Sugarcane crop. Detailed clarification regarding extent of irrigation in the proposed scheme shall be submitted along with the list of villages and districts that will be benefited in the proposed scheme.
5. Land requirement details are to be reconciled between the EIA report and Form 2 including the total land requirement of land with break up.
6. Capital and recurring cost submitted in Annexure II are to be same as per the EIA/EMP report. The cost estimated (for both Capital and recurring) for implementation of EMP shall be submitted as per the Terms of Reference.

****

Item No. 27.5 **Nardave Medium Irrigation Project at Nardave, Tal: Kankavali, Dist.: Sindhudurg by M/s Water Resources Department, Konkan Irrigation Development Corporation, Maharashtra - Regarding reconsideration of Environmental Clearance.**

File No. J12011/7/2017-IA.I(R), Proposal No. IA/MH/RIV/62328/2017

The Project Proponent (PP) along with MITCON Consultancy and Engineering Services Ltd., Pune made a detailed presentation of the project and *inter-alia,* provided the following information:

The project envisages construction of concrete gravity dam having a maximum height of 66.43 m and 1,749 m length with gated spillway on the right flank and Irrigation cum Power Outlet (ICPO) on the left flank with gross storage capacity of 123.74 MCM on Gad river near Nardave village in Sindhudurg district of Maharashtra state.

The project has GCA of 12,631 ha, CCA of 9,978 ha and ICA of 8,084 ha on both the banks of Gad river to be benefitted by 48 villages of Kankavali, Kudal and Malvan Talukas of Sindhudurg District. Irrigation proposed in the project is by lift irrigation for which a series of 14 Nos. of K.T. Weirs shall be provided along the river course to enable lifting of water for irrigation. The project also envisages a ROR scheme underground powerhouse with generation capacity of 3 MW (2x1.5 MW). Total catchment area is 47.70 km^2. There is no upstream

APPENDIX 5: MOEF&CC writes to the project proponent granting EC dated 13.12.2019

No. J-12011/04/2007-IA-I (R)
Government of India
Ministry of Environment, Forest & Climate Change
(IA.I Division)

Indira Paryavaran Bhawan
3rd Floor, Vayu Wing
Jor Bagh Road
New Delhi-110 003

Dated: 13th December, 2019

To

The Office of Executive Engineer,
Jamrani dam construction Division-I
Damuvaduga-Kalhgodam,
Distt Nainital, Uttarakhand

Sub: Jamrani Dam Multipurpose Project by Irrigation Department, Uttarakhand –Regarding Environmental Clearance.

Sir,

This has reference to your online proposal no. **IA/UK/RIV/80127/2006** and your letter No. 110/J.D.C.D-2/Environment Clearance dated 30.01.2019 on the above-mentioned subject.

2. The above referred proposal was considered by the Expert Appraisal Committee (EAC) for River Valley & Hydroelectric projects in its 27th meeting held on 23.09.2019. The comments and observations of EAC on the project may be seen in the Minutes of the meeting which are available on the web-site of this Ministry.

3. Jamrani Dam Multipurpose Project envisages construction of 480m long and 130.60 m high (above river bed level) roller compacted concrete gravity dam across the river Gola, a tributary of river Ramganga, a flashy seasonal river which originates in Kumaon Himalayas and flows through South Eastern Kumaon in the State of Uttarakhand, India. Jamrani MPP is proposed near village Jamrani, district Nainital, Uttarakhand 10 km upstream of existing Gola barrage which is located near Kathgodam. The catchment area at proposed dam site is 450 km^2. The live storage created by project is proposed to be used for drinking water, irrigation & power generation. The live storage of the project about 142.72 MCM out of which 42.7 MCM will be utilized for meeting the requirement of drinking water to Haldwani city and an additional irrigation to 57,065 ha with an incidental hydro power generation of 14 MW installed capacity with estimated annual power generation of 64 MU out of which 57.74 MU would be available at bus bars. Construction of Jamrani dam was proposed to be constructed to provide augmentation storage for Gola barrage.

4. Total land required for the project is 475.19 ha, out of which forest land is 351.55 ha, private land is 89.68 and others is 33.96 ha. Project benefit besides additional irrigation area of 57,065 ha, 42.7 MCM for drinking water and annual power generation of 64 MU, includes pisciculture, attraction of tourism, recharge of groundwater in adjoining area, creation of employment among the local people, infrastructure development of the area, etc. After the

1

APPENDIX 5 (contd.)

construction of Jamrani dam, employment opportunities and standard of living of the local people will be provided. Total cost of the project is Rs. 2584.10 crores.

5. Terms of Reference to the above project was issued on 23.04.2007 and the Public Hearing for the above mentioned project was held on 12.05.2008 in village Damuadunga, Tehsil Haldwani which is approximately 3 km away from the Kathgodam Railway Station. The meeting was presided by Upper collector, Nainital and Organized by Uttarakhand State Pollution Control Board, Dehradun.

6. EAC in the 35th meeting dated 19th Feb., 2010, had recommended Environmental Clearance. In absence of Forest Clearance for the diversion of forest land, EC of the Project was kept in abeyance till the Stage-I Forest Clearance (351.55 ha) for the project was obtained vide letter No. 8-36/2013-FC, dated 25.04.2018. After obtaining Forest Clearance, a request for reconsideration for grant of EC was made by the Project Proponent vide letter No. 681/ PCH/R-13/E.I.A. dated 09.05.2018. The Ministry advised to upload the relevant documents for the EC application online for further reconsideration. Relevant documents were then uploaded online by the PP for consideration of grant Environmental Clearance. Proposal was then considered by the EAC in the 22nd meeting held on 27.02.2019. The EAC after detailed deliberations and considering all the facts of the project as presented by the PP, deferred the proposal and sought some additional information including one season baseline data. The Project Proponent (PP) submitted the additional information as sought by the EAC on 23.08.2019. Accordingly, proposal was considered in the 27th meeting held on 23.09.2019.

7. The Expert Appraisal Committee (EAC) in its 27th meeting held on 23.09.2019, after due consideration of the relevant documents submitted by the Project Proponent and clarifications furnished, have recommended for grant of Environmental Clearance for the project mentioned above. Accordingly, the Ministry of Environment, Forest and Climate Change hereby accords Environmental Clearance for the above project as per the provisions of Environmental Impact Assessment Notification, 2006 and as amended thereof, subject to compliance of the following conditions and as given in Annexure I (i.e. Standard EC conditions for River Valley and Hydroelectric projects):

I. The Environmental Management Plan (EMP), excluding Resettlement & Rehabilitation Plan cost, shall be strictly adhered to and a sum of Rs. 10669.23 lakhs (Capital cost: 10067.15 lakhs & annual Recurring cost: Rs. 95.81 lakhs) as the budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be revised.

II. The project proponent shall comply with the provisions contained in this Ministry's OM vide F. No. 22-65/2017-IA.III dated 1st May, 2018 regarding Corporate Environment Responsibility. Project proponent shall require to invest Rs 1292.68 lakhs for CER activities as submitted to the Ministry for Education, Health care, Infrastructure development, Sanitations and drinking water facilities, Skill Development and Training, Environment Enhancement. The entire activities under CER shall be treated as project and shall be monitored. The monitoring report shall be submitted to the Regional Office as a part of half-yearly compliance report and to the District Collector.

III. The environmental clearance is valid for a period of 10 years from the date of issue of this letter for commissioning of the project.

APPENDIX 5 (contd.)

IV. After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment and downstream ecology. The study shall be undertaken by an Independent Agency, decided in consultation with the Ministry.

V. Any other clearances/permissions/approvals from any other organization/department, as applicable to the project shall be taken.

VI. PP shall procure construction material only from those Govt./Pvt. Agencies/ Corporations etc. that are having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.

VII. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.

VIII. Wildlife Conservation plan for all Schedules I species shall be implemented with the approval of the Competent Authority.

IX. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

X. Project is falling in the dudwa-lagga tiger corridor therefore *"No Objection Certificate" shall be obtained from Nation Tiger Conservation Authority (NTCA).*

XI. Project is located at a distance of 6.28 Km from the Nandhaur wildlife sanctuary and final ESZ notification **is not notified** therefore clearance from Standing Committee of the National Board for Wildlife (SCNBWL) shall be obtained.

This issues with approval of the Competent Authority.

Yours faithfully

(Dr Mohit Saxena)
Scientist C

Copy to:

1. The Secretary, Ministry of Power, Sharm Shakti Bhawan, Rafi Marg, New Delhi-110001
2. The Secretary, Ministry of Water Resources, RD & GR, Shram Shakti, Bhawan, Rafi Marg, New Delhi - 110 001.

APPENDIX 6: Recommendation letter from Chief Wildlife Warden, Uttarakhand dated 26.10.2021

Recommendation letter

A Proposal has been received by this office from Jamrani Dam Multipurpose Project (Proposal No. FP/UK/WATER/5918/2021) regarding clearance of Dudhwa Laggha Tiger Corridor from NTCA. Jamrani Drinking Multipurpose Project envisages construction of 150.6m high roller compacted concrete gravity dam. Project is in keen public interest and beneficial for providing drinking water to Haldwani city and nearby areas. Flood protection, Irrigation and 14MW power generation are additional benefits of the project. Tiger Corridor Management Plan has been prepared to mitigate the impact of project. Hence, proposal is recommended with following conditions:

1. The forest land shall not be used for any purpose other than specified in the proposal.
2. The concerned territorial divisional forest officer/ director shall monitor the implementation of the project regularly & report for the violation, if any.
3. It shall be ensured that no laborer camp will be setup inside the forest area.
4. District Forest Officer shall ensure that all the activities in the Corridor Management plan shall be completed as per requirement.
5. User agency shall obtain the Environmental clearance as per the provisions of the Environmental (protection) Act. 1986, if required.
6. The user agency shall comply all the provisions of the Wildlife (protection) Act 1972 & all other Acts, rules, regulations, guidelines, Hon'ble Court Order (s) and pertaining to this project, if any, for the time being in force, as applicable to the project.

Dated: 26-10-2021

(J S SUHAG)
Chief Wildlife Warden
Uttarakhand

APPENDIX 7: Deputy Inspector General, NTCA letter to WII dated 02.12.2022 requesting to carry ecological impact assessment of the proposed Jamrani Dam in Nainital.

(18)

राष्ट्रीय व्याघ्र संरक्षण प्राधिकरण
NATIONAL TIGER CONSERVATION AUTHORITY
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के अन्तर्गत सांविधिक निकाय)
(Statutory Body under Ministry of Environment, Forest and Climate Change, Govt. of India)

F. No. 7-23/2021-NTCA **New Delhi, the December 2, 2022**

To,

The Director,
Wildlife Institute of India,
Dehradun

Sub: Evaluation of ecological impact of proposed Jamrani Dam Multipurpose Project by Irrigation Department, Uttarakhand-reg.

Sir,

Reference is invited to the subject cited above. In this context, I am directed to forward herewith a copy of online proposal no. FP/UK/WATER/5918/2021 pertaining to Jamrani dam multipurpose project for your kind information.

The project involves construction of 150.60 meter of high roller compacted gravity dam at Jamrani village in Bhimtal block of Nainital district in Uttarakhand The proposed project would affect approximately 24 km ^{2} area and cause submergence of approximately 4.28 km ^{2} area of the tiger corridor. The project proponents have prepared wildlife conservation plan and tiger corridor management plan, however, the ecological concerns for tiger and Indian elephant are not reflected appropriately in the said plans.

In view of the above, it is requested to assess the ecological impacts of the proposed dam at the cost of user agency and submit the assessment report to this authority at the earliest.

Encl: As above.

Yours faithfully,

(Rajendra G. Garawad)
Deputy Inspector General (NTCA)
Email: dig2-ntca@nic.in
Tel. (EPABX): + 91 11 24367837-39
FAX: +91 11 24367836

Copy to:

1. The Chief Wildlife Warden, Govt. of Uttarakhand.
2. The DIG (WL), MoEF&CC, New Delhi.

B-1 Wing, 7th Floor, Pt. Deendayal Antyodaya Bhawan, CGO Complex, Lodhi Road,
New Delhi – 110 003 Tel. (EPABX): + 91 11 24367837-39 FAX: +91 11 24367836, website: https://ntca.gov.in

APPENDIX 8: Assistant Inspector General of Forests (FC) letter to Principal Secretary, Forest department, GOU, approving the final/Stage II Forest Clearance of the Central Government for the diversion of 351.55 ha of forest land for the construction of Jamrani Dam in Nainital, dated 16.01.2023

8-36/2013FC

I/37339/2023

Government of India
Ministry of Environment, Forests and Climate Change
(FC Division)

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj
New Delhi - 110003.
Dated: 16th January, 2023

To

The Principal Secretary (Forest),
Government of Uttrakhand,
Dehradun.

Sub: Proposal for seeking prior approval of the Central Government under the Forest (Conservation) Act, 1980 for non-forestry use of 351.55 ha (originally proposed 381.43 ha) of forest land for construction of Jamrani Dam Project in favour of Executive Engineer, Jamrani Dam Project, Irrigation Department, Government of Uttarakhand under the Forest Division and District Nainital, Uttarakhand (Online Proposal No. FP/UK/IRRIG/1244/2013).

Madam/Sir,

I am directed to refer to theState Government of Uttrakhand's letter No. 20/7-1-2013-300(4160)/2013 dated 15.04.2013 on the above mentioned subject, wherein prior approval of the Central Government for non-forestry use of 351.55 ha (originally proposed 381.43 ha) of forest land for construction of Jamrani Dam Project in favour of Executive Engineer, Jamrani Dam Project, Irrigation Department, Government of Uttarakhand under the Forest Division and District Nainital, Uttarakhand, was sought in accordance with Section-2 of the Forest (Conservation) Act, 1980. After careful consideration of the proposal by the Forest Advisory Committee (FAC) constituted under Section-3 of the said Act, ***In-principle approval /stage-I clearance*** for diversion of the proposed forest land was accorded by the Ministry vide its letter of even number dated 25.04.2018 subject to fulfilment of certain conditions. The State Government of Uttrakhand has furnished compliance report in respect of the conditions stipulated in the stage-I approval and has requested to the Central Government to grant of final (Stage-II) approval.

2. In this connection, I am directed to say that on the basis of the compliance report furnished by the State Government of Uttrakhand's letters No. 592/1-G-1467 (Nanital); Dehradun dated 27.08.2020, 290/1G-1467 (Nanital) dated 24.06.2021, and letter No. 1G-1467 (Naini) dated 02.07.2022, letter No.940/1G-1467 (Nainital) Part – II dated 03.10.2022 and 1510/1G-1487 (Naini) Dehradun dated 22.12.2022 ***Final/Stage–II approval*** of the Central Government is hereby granted under Section-2 of the Forest (Conservation) Act, 1980 for non-forestry use of 351.55 ha (originally proposed 381.43 ha) of forest land for construction of Jamrani Dam Project in favour of Executive Engineer, Jamrani Dam Project, Irrigation Department, Government of Uttarakhand under the Forest Division and District Nainital, Uttarakhand, subject to the following conditions:

16/01/2023

APPENDIX 8 (contd.)

8-36/2013FC

I/37339/2023

A: Conditions which need to be complied prior to handing over of forest land to user agency by the State Government:

i. The State Govt. shall ensure the complete compliance of FRA, 2006; It should also be ensured that the FRA certificate issued by District collector is complete with letter number, date, name, signature and official seal, as required in the certificate;

ii. The User Agency shall implement the R&R Plan as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF & CC along with indicators for monitoring and expected observable milestones;

iii. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required.

B: Conditions which need to be complied after handing over of forest land to the user agency by the State Govt.:

i. Legal status of the diverted forest land shall remain unchanged;

ii. The proposed forest land i.e. 351.55 ha shall be handed over to the User Agency only when the User Agency has acquired the required non-forest land, if any, for the project;

iii. Compensatory afforestation shall be taken up by the Forest Department over identified equivalent non-forest Civil Soyam land i.e. 351.55 ha and balance seedlings shall be planted by the Forest Department on the identified 143.0 ha degraded forest land with provision for ten years on subsequent maintenance. The plantation shall be undertaken within three years of this approval;

iv. The State Government shall ensure that the identified non-forest land to be transferred and mutated in favour of the State Forest Department for raising Compensatory Afforestation shall be notified as reserved Forest under Section-4 or Protected Forest under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act. The Nodal officer must report compliance within a period of 6 month from the date of grant of final approval and send a copy of the notification declaring the non-forest land under Section 4 or Section 29 of the Indian Forest Act, 1927, or under the relevant section of the local Forest Act as the case may be, to this Ministry for information and record;

16/01/2023

v. The State Government shall ensure that the user agency will carry out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down. The dumping area for muck disposal shall be stabilized and reclaimed by planting suitable species by the user agency at the cost of project under the super vision of State Forest Department. Retaining walls and terracing

APPENDIX 8 (contd.)

shall be carried out to hold the dumping material in place. Stabilization and reclamation of such dumping sites shall be completed before handing over the same to the State Forest Department in a time bound manner as per Plan;

vi. User Agency shall restrict the felling of trees to minimum numbers in the diverted forest land and trees shall be felled under strict supervision of the State Forest Department;

vii. The felling of trees shall be restricted to FRL-4 meter only and felling of trees shall be carried out by the State Forest Department. Number of trees to be removed shall be kept at barest minimum during the execution of the project;

viii. The State Forest Department shall implement the approved Catchment Area Treatment (CAT) Plan from the funds already deposited by the User Agency;

ix. User agency shall undertake afforestation along the periphery of the reservoir;

x. The layout plan of the proposal shall not be changed without prior approval of Central Government;

xi. No labour camp shall be established on the forest land;

xii. Sufficient firewood, preferably the alternate fuel, shall be provided by the User Agency to the labour after purchasing the same from the State Forest Department or the Forest Development Corporation or any other legal source of alternate fuel;

xiii. The boundary of the diverted forest land shall be suitably demarcated on ground at the project cost, as per the directions of the concerned Divisional Forest Officer;

xiv. No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;

xv. The State government shall ensure that the user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Birds' nests artificially made out of Eco-friendly material Shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project.

xvi. The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;

16/01/2023

xvii. The forest land shall not be used for any purpose other than that specified in the project proposal;

xviii. User agency shall provide free water for forestry related activities/ projects;

APPENDIX 8 (contd.)

8-36/2013FC

I/37339/2023

xix. The forest land proposed to be diverted shall under no circumstances be transferred to any other agencies, department or person without prior approval of Govt. of India;

xx. The User Agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

xxi. The Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the para 1.21 of comprehensive guidelines issued vide this Ministry F. No.5-2/2017-FC dated 28th March, 2019;

xxii. The User Agency and the State Government shall ensure compliance to provisions of the all Act, Rules, Regulations, Guidelines, NGT Order (s) and relevant Hon'ble Court Order (s), if any, pertaining to this project for the time being in force, as applicable to the project;

xxiii. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife, subject to the approval of the competent authority.

xxiv. The User Agency shall submit the annual self-compliance report in respect of the above conditions and also to the conditions stipulated in Stage -I clearance to the State Government, concerned Regional and this Ministry by the end of March of every year regularly.

Yours faithfully,

(6/01/2025

(Suneet Bhardwaj)
Assistant Inspector General of Forests

Copy to:

1. PCCF (HoFF), Department of Forest, Government of Uttrakhand, Dehradun
2. Regional Officer, MoEF&CC's IRO, Dehradun.
3. APCCF cum Nodal Officer (FCA), Department of Forest, Government of Uttrakhand, Dehradun
4. User Agency.
5. Monitoring Cell, FC Division, MoEF&CC.

APPENDIX 9: WII constitutes a 4 member study team for carrying the ecological impact assessment of the proposed Jamrani Dam in Nainital dated 10.03.2023.

F.No. WII-EIA/JAMRANI-DAM/UK/23

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

Date: 10 March 2023

To,

The Executive Engineer,
Jamrani dam construction division- 2
Damuadhunga Haldwani
Uttarakhand -263139
Email: eejdcd3@gmail.com

Sub: Evaluation of Ecological Impact of Proposed Jamrani Dam multipurpose project by Irrigation Department, Utttarakhand-reg.

Ref: Letter F.No. 7-23/2021-NTCA/New Delhi dated 2.12.2022

Sir/Madam,

With reference to the above. I am pleased to inform that the WII has constituted a 4 members study team for the above mentioned assessment. The following are the details of the team: -

1. Dr. G.V. Gopi, NO, EIA Cell, WII – Chairman
2. Dr. Swati Saini, Scientist, Tiger Cell, WII - Member
3. Mr. Deb Ranjan Laha, Senior Project Biologist, Tiger Cell, WII- Member
4. Dr. Kausik Banerjee, Scientist, Tiger Cell, WII – Member Secretary

The above study team will carry out the Rapid assessment during mid-April 2023 and submit the report to NTCA by end of May 2023.

A budget with lumpsum estimates for the rapid assessment is proposed below:

a. Faculty Time 4 x 1 month INR 1,50,000 – INR 6,00,000/-
b. Travel from WII to field site & Back, Lodging & boarding for study team (lumpsum) – INR 3,00,000/-
c. Contingency & Miscellaneous – INR 3,00,000/-
d. Institutional Cost (20%) – INR 2,40,000/-

The total cost of budget is **14,40,000/- (INR Fourteen Lakh Forty Thousand only)**

The proposed funds may be transferred to WII to initiate the assessment.

Your Sincerely,

10/3/23

(Virendra R. Tiwari)
Director

Copy to-

1. The Deputy Inspector General (NTCA), NTCA, New Delhi Email: dig2-ntca@nic.in
2. The Chief Wildlife Warden, Govt. of Uttarakhand. Email: cwlwua@yahoo.co.in
3. The DIG(WL), MoEF&CC, New Delhi. Email: digwl-mefcc@gov.in

पत्रपेटी सं0 18, चन्द्रबनी, देहरादून – 248 001, उत्तराखण्ड, भारत
Post Box No. 18, Chandrabani, Dehradun - 248 001, Uttarakhand, INDIA
ई.पी.ए.बी.एक्स. :+91-135-2640114, 2640115, 2646100 फैक्स : 0135-2640117
EPABX : +91-135-2640114, 2640115, 2646100 Fax: 0135-2640117
ई–मेल / E-mail : wii@wii.gov.in वेब / Website: www.wii.gov.in

APPENDIX 10: Executive Engineer, Uttarakhand Irrigation Department letter to WII regarding the fund allocation dated 16.03.2023.

अधिशासी अभियन्ता,
जमरानी बांध निर्माण खण्ड–2,
दमुवाढुंगा, हल्द्वानी,
नैनीताल, 263139,
ई–मेल: eejdcd3@gmail.com,
Ph. 05946-298698

Uttarakhand Irrigation Department
सिंचाई विभाग उत्तराखण्ड

Executive Engineer,
Jamrani Dam Cons. Div. -2,
Damuadhunga, Haldwani,
Nainital, 263139,
E-mail: eejdcd3@gmail.com,
Ph. 05946-298698

45

पत्रांकः–192 /EE/ JDCD-2/NTCA/ 2023,
दिनांकः– 16-3-2023 MARCH, 2023,

Via- Mail & Post

To,

The Director,
Wildlife Institute of India,
Dehradun Uttarakhand,

Sub- Evaluation of Ecological Impact of proposed Jamrani Dam multipurpose project by Irrigation Department, Uttarakhand-reg.

Ref:- WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23 dated 10.03.2023

Dear Sir,

With reference to the above mentioned letter, it is to be informed that we have been reviewed the proposal submitted by you and project authority has been sent the same to the Government of Uttarakhand for allotment of funds with respect to budget demand of Rs. 14.40 Lakhs.

Above of fund allocation is expected soon for related work. Therefore, you are requested to provide the account details for transfer of the budget and also it is requested you to start the work as soon as possible.

The Project agency will be grateful to you for the same.

Thank you,

Yours truly

Lalit Kumar 16/3/23
Lalit Kumar
Executive Engineer

Copy to: - for information & necessary action please.

1. GM, PIU Jamrani/ SE Project Circle Jamrani, Haldwani
2. Project Manager, PIU Jamrani, Haldwani
3. Concern Assistant Engineer, JDCD-2

DWII OFFICE
DIARY NO. 4410
DATE 21/4/23

Registered
Dr Gupta
21/4/23

Immediate
VPS
21/4/23

Lalit Kumar
Executive Engineer

APPENDIX 11: Nodal officer, EIA cell, WII letter to Executive Engineer, Jamrani Dam Construction Division -2, regarding fund transfer for the rapid assessment.

(3)

F.No. WII-EIA/JAMRANI-DAM/UK/23/157

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

Date: 17.03.2023

To,

The Executive Engineer,
Jamrani dam construction division- 2
Damuadhunga Haldwani
Uttarakhand -263139
Email: eejdcd3@gmail.com

Sub: Evaluation of Ecological Impact of Proposed Jamrani Dam multipurpose project by Irrigation Department, Utttarakhand-reg.
Ref: Your letter 1925/EE/JDCD-2/NTCA/2023 Dated: 16 March, 2023.

Sir/Madam,

With reference to your above referenced letter, below are the bank account details for the fund transfer of **INR 14,40,000/- (In Words Rupees Fourteen Lakh Forty Thousand Only).**

BANK ACCOUNT DETAILS

BENEFICIARY NAME	DIRECTOR, WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
BANK NAME	UNION BANK OF INDIA
BRANCH NAME WITH COMPLETE ADDRESS AND TELEPHONE NUMBER	UNION BANK OF INDIA, CHANDRABANI, DEHRADUN 0135-2641178
WHETHER THE BRANCH IS RTGS ENABLES? IF YES, THEN WHAT IS THE BRANCH'S IFSC CODE	RTGS Enabled. IFSC CODE – UBIN0551856
TYPE OF BANK ACCOUNT (SB/CURRENT/ CASH CREDIT)	SB ACCOUNT
BANK ACCOUNT NUMBER	518502010059370
MICR CODE OF BANK	248026006
SWIFT CODE	UBININBBDER

Thanking you,

EV 91048139 4IN

O/C 17-3-23

Yours sincerely,

(Dr. G.V. Gopi)
Nodal Officer, EIA Cell

Copy to-

1. The Deputy Inspector General (NTCA), NTCA, New Delhi Email: dig2-ntca@nic.in
2. The Chief Wildlife Warden, Govt. of Uttarakhand. Email: cwlwua@yahoo.co.in
3. The DIG(WL), MoEF&CC, New Delhi. Email: digwl-mefcc@gov.in

पत्रपेटी सं0 18, चन्द्रबनी, देहरादून – 248 001, उत्तराखण्ड, भारत
Post Box No. 18, Chandrabani, Dehradun - 248 001, Uttarakhand, INDIA
ई.पी.ए.बी.एक्स. :+91–135–2640114, 2640115, 2646100 फैक्स : 0135–2640117
EPABX : +91-135-2640114, 2640115, 2646100 Fax: 0135-2640117
ई–मेल / E-mail : wii@wii.gov.in वेब / Website: www.wii.gov.in

APPENDIX 12: Executive Engineer, Uttarakhand Irrigation Department letter to WII regarding fund transfer dated 27.03.2023.

अधिशासीअभियन्ता,
जमरानीबांध निर्माण खण्ड–2,
दमुवाढुंगा, हल्द्वानी,
नैनीताल, 263139,
ई–मेल: eejdcd3@gmail.com,
Ph. 05946-298698

Uttarakhand Irrigation Department
सिंचाई विभाग उत्तराखण्ड

Executive Engineer,
Jamrani Dam Cons. Div. -2,
Damuadhunga, Haldwani,
Nainital, 263139,
E-mail: eejdcd3@gmail.com,
Ph. 05946-298698

पत्रांक: 1954 /EE/ JDCD-2/NTCA/2023,
दिनांक: 27 MARCH, 2023,

To,

The Director,
Wildlife Institute of India,
Dehradun Uttarakhand.

Via- Mail & Post

Sub- Evaluation of Ecological Impact of proposed Jamrani Dam multipurpose project by Irrigation Department, Uttarakhand-reg.

Ref:- 1. WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23 dated 10.03.2023,
2. Our Letter No. 1925/EE/JDCD-2/ NTCA/ 2023 Dated 16.03.2023,
3. WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23/157 dated 17.03.2023,

Dear Sir,

Kindly take note of the above referenced letters on above subject line. In continuation to above it is to bring to your kind notice that we are in a position to process a payment of Rs 10,00,000/- (Ten lakh rupees only) through bank transfer in account as provided via above referred letter (3). We will be transferring balance remaining payment of Rs. 4,40,000/- as soon as possible.

You are hereby requested to get the assignment initiated on an urgent basis. We would really appreciate if the site visit schedule of the team undertaking the assignment is also shared with us.

Thanking you,

Yours truly

27/3/23
Lalit Kumar
Executive Engineer

Copy to: - for information & necessary action please.

1. GM, PIU Jamrani/SE Project Circle Jamrani, Haldwani,
2. Project Manager, PIU Jamrani, Haldwani,
3. Concern Assistant Engineer, JDCD-2,

27/3/23
Lalit Kumar
Executive Engineer

APPENDIX 13: EE, Uttarakhand Irrigation Department letter to WII, regarding fund transfer and site visit schedule, dated 29.03.2023

अधिशासीअभियन्ता,
जमरानीबांध निर्माण खण्ड–2,
दमुवाढुंगा, हल्द्वानी,
नैनीताल, 263139,
ई–मेल: eejdcd3@gmail.com,
Ph. 05946-298698

Uttarakhand Irrigation Department
सिंचाई विभाग उत्तराखण्ड

43

Executive Engineer,
Jamrani Dam Cons. Div. -2,
Damuadhunga, Haldwani,
Nainital, 263139,
E-mail: eejdcd3@gmail.com,
Ph. 05946-298698

पत्रांक:- 1959 /EE/ JDCD-2/NTCA/2023,
दिनांक:- 29- MARCH, 2023, (29·3·23)

To,

The Director,
Wildlife Institute of India,
Dehradun Uttarakhand,

Via- Mail & Post

Sub- Evaluation of Ecological Impact of proposed Jamrani Dam multipurpose project by Irrigation Department, Uttarakhand-reg.

Ref:- 1. WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23 dated 10.03.2023,
2. Our Letter No. 1925/EE/JDCD-2/ NTCA/ 2023 Dated 16.03.2023,
3. WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23/157 dated 17.03.2023,

Dear Sir,

Kindly take note of the above referenced letters on above subject line. In continuation to above it is to bring to your kind notice that we are in a position to process a payment of Rs 10,00,000/- (Ten lakh rupees only) through bank transfer in account as provided via above referred letter (3). We will be transferring balance remaining payment of Rs. 4,40,000/- as soon as possible.

You are hereby requested to get the assignment initiated on an urgent basis. We would really appreciate if the site visit schedule of the team undertaking the assignment is also shared with us.

Thanking you,

Yours truly

29/3/23
Lalit Kumar
Executive Engineer

Copy to: - for information & necessary action please.

1. GM, PIU Jamrani/SE Project Circle Jamrani, Haldwani,
2. Project Manager, PIU Jamrani, Haldwani,
3. Concern Assistant Engineer, JDCD-2,

Lalit Kumar
Executive Engineer

DWII OFFICE
INWARD NO. 4355
DATE 6/4/23

Dr Cristi
Have we recd funds? Please verify & discuss.
12/4

APPENDIX 14: Nodal officer (EIA cell), WII letter to DFO, Nainital informing the undertaking of site inspection of the proposed dam by WII study team from 17 to 22 April 2023.

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

F.No. WII-EIA/JAMRANI-DAM/UK_23 Date: 06.04.2023

To

The Divisional Forest Officer,
Forest Division Nainital,
Nainital,
Uttarakhand.
Email: dfonainital@gmail.com,
dfonainital@yahoo.com

Sub: Site Inspection visit of WII team - regarding.

Ref: 1. Letter F. No. 7-23/2021-NTCA/New Delhi dated 2.12.2022
2. Letter F.No. WII-EIA/JAMRANI-DAM/UK/23 dated 10.03.2023

Sir,

In reference to the above, I would like to inform you that the WII team (as mentioned in Ref.2) will be undertaking the site inspection of the proposed Jamrani Dam MPP sites between 17 and 22 April 2023. Few members of the team will continue to stay until 05 May 2023 for field data collection. Our team would like to meet you on 18 April 2023, at your convenient time for an interaction to brief about the planned work & approach.

It is requested that, a Forest department official may kindly be deputed to accompany our team during the site inspection visit and accommodation at the nearest Forest rest house be kindly provided for the WII team.

Thanking you,

Yours Sincerely,

06/04

(Dr. G.V. Gopi)
Nodal Officer, EIA Cell
9412053644

Copy for information to:

1. The Deputy Inspector General (NTCA), New Delhi. Email: dig2-ntca@nic.in
2. The Chief Wildlife Warden, Govt. of Uttarakhand. Email: cwlwua@yahoo.co.in
3. The DIG(WL), MoEF&CC, New Delhi. Email: digwl-mefcc@gov.in
4. The Executive Engineer, Jamrani dam construction division – 2 Haldwani Uttarakhand. Email: eejdcd3@gmail.com

पत्रपेटी सं0 18, चन्द्रबनी, देहरादून – 248 001, उत्तराखण्ड, भारत
Post Box No. 18, Chandrabani, Dehradun - 248 001, Uttarakhand, INDIA
ई.पी.ए.बी.एक्स. :+91–135–2640114, 2640115, 2646100 फैक्स : 0135–2640117
EPABX : +91-135-2640114, 2640115, 2646100 Fax: 0135-2640117
ई–मेल / E-mail : wii@wii.gov.in वेब / Website: www.wii.gov.in

APPENDIX 15: Urgent letter by Chief Standing Counsel, Uttarakhand High Court, Nainital to Chief Secretary, Uttarakhand Govt. to file the progress report in the form of response affidavit within a period of 2 weeks w.e.f. 03.05.2023.

C.S. Rawat,
Chief Standing Counsel
Uttarakhand Government
High Court of Uttarakhand
Nainital Pin - 263001

Office of the Chief Standing Counsel,
Uttarakhand High Court, Nainital,
Mallital, Nainital-263001
Fax:- +91-5942-235687
E mail cschcntl@gmail.com
Mobile:- 7417170464

MOST URGENT FAX / E-MAIL MESSAGE

Date: 3-5-2023

To,

The Chief Secretary, Uttarakhand Government, Dehradun.

Subject:- Civil Contempt Petition No. 594 of 2019 "Ravi Shankar Joshi Vs. Dr. Utpal Kumar Singh, then posted as Chief Secretary, Govt. of Uttarakhand, Dehradun & Another."

Sir,

Please take reference of the above noted contempt petition which has been filed by the petitioner for the alleged non compliance of the judgment and order dated 2-11-2018 passed by the Hon'ble Court in Writ Petition (PIL) No. 138 of 2017 wherein directions were given to the Chief Secretaries of State of U.P. and State of Uttarakhand respectively to send the proposal before the Ministry of Environment, Forest & Climate Change, Govt. of India to seek N.O.C. for change of user from Forest land for construction of the Dam in accordance with law and complete all the codal formalities for construction of Dam at the earliest.

In reply to the contempt petition, a response affidavit was filed on12-10-2022 on behalf of your goodself wherein it was stated that the Ministry of Environment, Forest & Climate Change, Govt. of India has accorded Environmental clearance vide letter dated 13-12-2019 for Jamrani Dam Multi Purpose Project, District Nainital with a condition to obtain N.O.C. from National Tiger Conservation Authority (N.T.C.A.). It was also stated that the State of Uttarakhand has already requested to the Addl. Director General (Wildlife), Standing Committee, National Wildlife Board, Ministry of Environment, Govt. of India for grant of N.O.C. and thus there is no delay on the part of the State of Uttarakhand in obtaining the N.O.Cs and completing the requisite codal formalities for the construction of the Jamrani Dam Project, therefore, there is no deliberate and willful on the part of the State Govt. of Uttarakhand.

Most Urgent

On 29-3-2023 the Hon'ble Court, after perusing the response affidavit filed on 12-10-2022, asked the State Counsel to apprise the Hon'ble Court regarding the further progress in the matter. In this regard, a communication was made to your goodself and in reply to the said communication we received detailed instructions (on behalf of your goodself) vide letter dated 2-5-2023 issued from the level of Secretary, Irrigation and Flood Control, Section-2, Uttarakhand Government referring the letter dated 2-12-2022 issued by the N.T.C.A. to the Director, Wildlife Institute of India,

APPENDIX 15 (contd.)

C.S. Rawat,
Chief Standing Counsel
Uttarakhand Government
High Court of Uttarakhand
Nainital Pin - 263001

Office of the Chief Standing Counsel,
Uttarakhand High Court, Nainital,
Mallital, Nainital-263001
Fax:- +91-5942-235687
E mail cschcntl@gmail.com
Mobile:- 7417170464

Dehradun for assessing the ecological impacts of the proposed Dam at the cost of the user agency and requested the Wildlife Institute of India (W.I.I.), Dehradun to submit the assessment report to the N.T.C.A. In pursuance to the same, W.I.I., Dehradun on 10-3-2023 constituted a four member Committee for completing the assessment and various other instructions were in the letter dated 2-5-2023 were received.

Today the matter was listed before the Hon'ble Court and the undersigned apprised the Hon'ble Court by the aforementioned instructions received in the matter. The Hon'ble Court, after hearing the parties, directed the undersigned to file the progress report in the form of response affidavit on behalf of your goodself within a period of two weeks w.e.f. 3-5-2023, stating the current status in the matter (as mentioned in the instructions supplied to the Office of undersigned vide letter dated 2-5-2023).

The Hon'ble Court has been pleased to post the matter on 16-6-2023 for further hearing.

As such, please look into the matter and do the needful regarding filing of response affidavit in the matter accordingly.

With regards,

Yours sincerely,

CSRawat

(C.S. Rawat)
Chief Standing Counsel

Copy forwarded for information to:-
1-The Secretary, Law cum L.R., Uttarakhand Government, Dehradun.

CSRawat

(C.S. Rawat)
Chief Standing Counsel

APPENDIX 16: Executive Engineer, Uttarakhand Irrigation Department letter to WII dated 06.05.2023 informing the next schedule of Hon'ble High Court of Uttarakhand on 16th June, 2023.

अधिशासी अभियन्ता,
जमरानी बांध निर्माण खण्ड–2,
दमुवाढुंगा, हल्द्वानी,
नैनीताल, 263139,
ई–मेल: eejdcd3@gmail.com,
Ph. 05946-298698

Uttarakhand Irrigation Department
सिंचाई विभाग उत्तराखण्ड

Executive Engineer,
Jamrani Dam Cons. Div. -2,
Damuadhunga, Haldwani,
Nainital, 263139,
E-mail: eejdcd3@gmail.com,
Ph. 05946-298698

Letter No.: 64 /EE/ JDCD-2/NTCA/ 2023,
Date : 06 May, 2023,
Via- Mail & Post

To,

The Director,
Wildlife Institute of India,
Dehradun Uttarakhand

Online Proposal No. FP/UK/WATER/5918/2021

Sub- Evaluation of Ecological Impact of proposed Jamrani Dam multipurpose project by Irrigation Department, Uttarakhand-reg.

Ref:-
1. NTCA Letter- F. No. 7-23/2021-NTCA, New Delhi, 02.12.2022,
2. WII Letter- F. No. WII-EIA/JAMRANI-DAM/UK/23 dated 10.03.2023,
3. Our Letter No. 1925/EE/JDCD-2/ NTCA/ 2023 Dated 16.03.2023 & 1954/EE/JDCD-2/ NTCA/ 2023 Dated 29.03.2023,
4. Chief Standing Council, Uttarakhand Government, Hon'ble High court of Uttarakhand letter dated 03.05.2023 (attached).

Dear Sir,

Ministry of Environment, forests and climate change (MOEFCC) issued Environment Clearance (EC) for the proposed project on 13.12.2019. As per EC condition No. 7(x), **Project is falling in tiger corridor (said Dudhwa-Lagga),** therefore, NOC shall be obtained from National Tiger Conservation Authority.

To comply with the EC condition, Project Proponent has submitted an online proposal to obtain NTCA/ wildlife clearance/ NOC from SC-NBWL. This proposal was forwarded by NTCA to Wildlife Institute of India (WII) vide above referred letter (1). WII formed a 4-member committee vide above referred letter (2) for rapid assessment, whose field work has already been completed.

I would like to bring in your notice that as per Hon'ble High court order's dated 02.11.2018 against Writ Petition number PIL No. 138 of 2017, directions were given to the Chief Secretaries of State of U.P. and State of Uttarakhand respectively to send the proposal before the Ministry of Environment, Forest & Climate Change, Govt. of India to seek NOC for Construction of Dam at the earliest. Civil Contempt Petition No. 594 of 2019 was also filed by the petitioner for non-compliance of the Judgment. Please take note of above referred letter (4), marked to Chief Secretary Uttarakhand Govt. regarding the above Contempt Petition.

Hon'ble High court of Uttarakhand is regularly reviewing the progress of Jamrani Dam and issuing the instructions to comply the judgment. Next hearing has been scheduled on 16th June 2023.

In continuation of above we request you to please compile the report of rapid assessment as soon possible so that it can be submitted to NTCA for further processing.

Thank you,

Yours truly

Enclosure: As above

for Executive Engineer 06/05/23

Copy to: - for information & necessary action please.

1. The Deputy Inspector General (NTCA), NTCA, New Delhi,
2. The Chief Wildlife warden, Govt. of Uttarakhand,
3. The DIG (WL), MoEF & CC, New Delhi,
4. GM, PIU Jamrani/ SE Project Circle Jamrani, Haldwani,
5. Project Manager & Assistant Engineer PIU Jamrani/ JDCD-2, Haldwani,

Executive Engineer 06/05/23

o/c

APPENDIX 17: List of stakeholders/participants who attended official meetings/visits to the proposed project site, for the assessment of proposed Jamrani Dam, Nainital

Date: 18.04.2023 Venue: Irrigation Department Office, Kathgodam

S.No.	Name	Designation	Department
1	Dr. G.V. Gopi	Scientist – F, Nodal Officer, EIA Cell, WII	WII, Dehradun
2	Dr. Kausik Banerjee	Scientist, WII-NTCA Tiger Cell	Tiger Cell, NTCA, New Delhi
3	Dr. Sumit Arya	Senior Project Associate	WII, Dehradun (EIA Cell)
4	Mr. Deb Ranjan Laha	Senior Project Associate	WII, Dehradun (Tiger Cell)
5	Ms. Stanzin Zangmo	Project Intern	WII, Dehradun (EIA Cell)
6	Mr. Avinash Yadav	Project Associate - I	WII, Dehradun (EIA Cell)
7	Mr. S.K. Singh	Project Manager - I	PIU Jamrani
8	Mr. Ajay Pant	Project Manager - IV	PIU Jamrani
9	Mr. B.B. Pandey	Deputy G.M. PIU Jamrani	PIU Jamrani
10	Mr. Lalit Kumar	Deputy G.M. PIU Jamrani	PIU Jamrani
11	Mr. Shah Nawaz	Assistant Project Manager	PIU Jamrani

Date: 19.04.2023 Venue: Nainital Zoo, Nainital (U.K.)

S.No.	Name	Designation	Department
1	Dr. G.V. Gopi	Scientist – F, Nodal Officer, EIA Cell, WII	WII, Dehradun
2	Dr. Kausik Banerjee	Scientist, WII-NTCA Tiger Cell	Tiger Cell, NTCA, New Delhi
3	Dr. Sumit Arya	Senior Project Associate	WII, Dehradun (EIA Cell)
4	Mr. Deb Ranjan Laha	Senior Project Associate	WII, Dehradun (Tiger Cell)
5	Ms. Stanzin Zangmo	Project Intern	WII, Dehradun (EIA Cell)
6	Mr. Avinash Yadav	Project Associate - I	WII, Dehradun (EIA Cell)
7	Mr. Chandra Sekhar Joshi	DFO	Nainital Forest Department
8	Mr. Hem Chandra	SDO	Nainital Forest Department
9	Mr. Bhanu Prakash Harbola	Range Officer	Nainital Forest Department
10	Latit Bora	Forest Guard	Nainital Forest Department
11	Mr. Ajay Pant	Project Manager - IV	PIU Jamrani
12	Mr. Shah Nawaz	Assistant Project Manager	PIU Jamrani
13	Mr. Dheeraj Beri	Resident Engineer	PIU Jamrani

APPENDIX 17 (contd.)

Date: 20.04.2023, Haidakhan Forest Rest House, Badon Range

S.No.	Name	Designation	Department
1	Dr. G.V. Gopi	Scientist – F, Nodal Officer, EIA Cell, WII	WII, Dehradun
2	Dr. Sumit Arya	Senior Project Associate	WII, Dehradun (EIA Cell)
3	Ms. Stanzin Zangmo	Project Intern	WII, Dehradun (EIA Cell)
4	Mr. Avinash Yadav	Project Associate - I	WII, Dehradun (EIA Cell)
5	Mr Bhanu Prakash Herbola	Range officer	Nainital Forest Department
6	Mr Deepak Kumar Tiwari	Deputy Range officer	Nainital Forest Department
7	Mr Hari Shanker Tamta	Forest Guard	East Okhaldhunga Beat
8	Mr Lalit Singh Bora	forest Guard	West Okhaldhunga Beat
9	Mr Lalit Sammal	Computer Operator	Nainital Forest Department
10	Mr Chandra Mohan Bisht	Beat Watcher	Nainital Forest Department
11	Mr Dunger Singh	Beat Watcher	Nainital Forest Department
12	Mr Subhash Belwal	Beat Watcher	Nainital Forest Department
13	Mr Narayan Samman	Beat Watcher	Nainital Forest Department
14	Mr Yogesh Samman	Beat Watcher	Nainital Forest Department
15	Mr Rajendra Prasad	Cook	Nainital Forest Department
16	Mr. Harish	Driver	WII, Dehradun

APPENDIX 18: Photos of landscape near the proposed dam site (Credit: Avinash Yadav)

Contact:
The Nodal Officer, EIA Cell
Wildlife Institute of India
Chandrabani
Dehradun - 248001
Email: eia@wii.gov.in