

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original Application No. 361/2018

IN THE MATTER OF

Narmada Pradushan Nivaran

Samiti & Ors.

...Applicant

VS

Ministry of Environment, Forest &

Climate Change & Ors.

... Respondents

**ADDITIONAL REPLY/FRESH STATUS REPORT ON BEHALF OF
RESPONDENT NO.2/NARMADA CONTROL AUTHORITY AND
RESPONDENT NO.3/MINISTRY OF JAL SHAKTI, DEPARTMENT OF
WATER RESOURCES, RIVER DEVELOPMENT AND GANGA
REJUVENATION**

MOST RESPECTFULLY SHOWETH:

1. That the Respondent Nos. 2 and 3 have filed reply by way of affidavit dt.30.07.2018 before this Hon'ble Tribunal, which is on record (Paper Book Page No. 482 to 627)

(R. VASUDEVAN)
Director (Civil)
Narmada Control Authority
(MoJS, DoWR, RD & GR)
INDORE (M.P.)

1

R. Vasudevan
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Director (Civil)
Narmada Control Authority
(MoJS, DoWR, RD & GR)
INDORE (M.P.)

2. That the Respondent Nos. 2 and 3 have filed Additional documents by way of affidavit before the Hon'ble Supreme Court in Civil Appeal No.4550/2019, which is on record (Paper Book Page No.1 to 18)
3. That the Respondent Nos. 2 and 3 have filed Additional documents by way of affidavit before the Hon'ble National Green Tribunal (NGT) in OA No.361/2018 dated 18.04.2024, which is on record (Paper Book Page No.-----)
4. That the present additional reply/ fresh status report is being filed to bring on record some facts and latest developments pertaining to the issue in the Original Application.
5. That during the 3rd E-flow Committee meeting held on 18th March, 2024, Representatives from Govt. of Gujarat urged the Committee to carry out an integrated study for desired E-flow for the entire stretch downstream to Garudeshwar weir rather than up to Bhadbhut Barrage so as to mitigate salinity levels and address the cultural needs of people, etc.
6. That the Representative from Govt. of Madhya Pradesh (GoMP) intimated that the proposal for carrying out the studies only in the part of Gujarat for about 161 km downstream of Sardar Sarovar Project (SSP) before draining in to Gulf of Cambay will not serve the purpose but insisted for carrying out the study for the entire Narmada Basin.
7. That the Representatives from Govt. of Maharashtra (GoM) and Govt. of Rajasthan (GoR) agreed to get the study carried out for the downstream of Garudeshwar weir up to Bhadbhut Barrage with a condition that the final

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Narmada Control Authority
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decision on the enhanced environmental flow shall require approval of their higher/Competent Authority.

8. That the Representative from Govt. of Rajasthan (GoR) also urged that any decision on upward revision of E-flow should not affect the water share of Rajasthan as it being an arid State. He informed that the economy of the three districts viz. Barmer, Jalore and Sanchore (earlier Sanchore was town and now declared as district) is totally dependent on this 0.50 MAF of Narmada water.
9. That the Expert Members suggested for carrying out the study downstream of Garudeshwar weir up to Bhadbhut Barrage, which is a long stretch of about 125 km instead of going for the whole basin. For the salinity mitigation, mangrove conservation and cultural needs of people below the Bhadbhut Barrage, which is an estuarine zone with wider mouth and varying cross-sections and hydraulic parameters which is a stretch of about 25 km from the mouth of the river, requirement of E-flow will be entirely different. Both the Expert Members from Central Water Commission (CWC) and Central Inland Fisheries Research Institute (CIFRI) stated that the methodology for assessment of E-flow is still not standardized in the estuarine ecosystem, referring the issues being faced while computing the E-flow for estuarine ecosystem of Mahanadi. Hence, the extended study area in accordance to Govt. of Gujarat (GoG) is not feasible at present moment. So, as per the decision taken in the 1st and 2nd meetings of the E-flow Committee, let it be till the Bhadbhut Barrage in the 1st phase.

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INDORE (M.P.)

10. That the Member (Env.&Reh.), NCA stated that as per norms, or as has been a practice in all Cumulative Impact Assessment of River Basin studies, E-flow is calculated only upto the next intervention in the downstream. The project upstream is not responsible to release an E-flow for any other project located in its downstream.
11. That the Govt. of Maharashtra was also of the opinion that for the downstream stretch of Bhadbhut Barrage, releases of adequate E-flow is the responsibility of Kalpaşar project and water from the 4 party States should not be utilized for the same.
12. That the Executive Member (EM), NCA & Chairman of the E-flow Committee stated that NCA is established for the purpose of securing compliance with and implementation of the decision and directions of the Narmada Water Dispute Tribunal (NWDT) Award. The E-flow Committee is taking up the reassessment work as per the decisions taken in 94th NCA meeting held on 8th May, 2023. Views of the NCA comprises of all the States and NCA takes any decision with the consensus of the party States. The proposed study will be carried out by the Sardar Sarovar Narmada Nigam Limited (SSNNL), GoG through Central Inland Fisheries Research Institute (CIFRI) as decided in the 1st and 2nd meeting of E-flow Committee.
13. That the Executive Member, NCA & Chairman of the E-flow Committee further stressed that by this time the study would have been awarded which is still pending. Moreover, as per the direction of Hon'ble NGT, all the States have to maintain a minimum E-flow in their rivers to protect the

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(MoJS, DoWR, RD & GR)
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riverine ecology and meet the societal needs. The intervening structures on River Narmada cannot be exempted from the regime of E-flow. Therefore, it is the responsibility of every State to maintain the E-flow in their territory. GoMP has also to ensure that minimum prescribed E-flow gets released from their diversion structures erected on River Narmada, upstream of Sardar Sarovar Dam.

14. That Award of study to Central Inland Fisheries Research Institute (CIFRI) is yet to be finalized because there was no consensus w.r.t. the stretch to be studied/ included for this E-flow. So, it has been decided that the issue shall be put up before the 95th NCA meeting for further direction. The Minutes of the 3rd E-flow Committee meeting issued on 3rd May, 2024, is placed at

Annex-R/13

15. That as the issue in the present O.A. involves an Award passed with the consent of four beneficiary States and as per Clause V of the said Award, review of its clauses can be done at any time after a period of 45 years from the date of publication of the Award on 12.12.1979. NCA is working for assessing the downstream E-flow. The States of Madhya Pradesh, Maharashtra, and Rajasthan are concerned that their share of water might get affected if the quantum of E-flow is enhanced from the present 600 cusecs, which is being released from the Godbole Gate and Garudeshwar weir throughout the year, in all season.

16. That the Respondent Nos. 2 & 3 in consultation and assistance with all the stakeholders are taking every measure to determine the downstream E-flow of River Narmada so that downstream ecology of the River Narmada is restored and maintained.

17. That the E-flow Committee formed by the Respondent Nos. 2 & 3, to find a solution for the issue of downstream E-flow of River Narmada, is consisting of experts from different fields and are capable of taking the right decision for maintaining the ecology of the River Narmada.

18. That the Respondent Nos. 2 & 3 will abide by whatever direction/order passed by this Hon'ble Tribunal.

[Handwritten Signature]
Deponent

Verification

Verified at New Delhi on _____ July, 2024 that the contents of above affidavit are true and correct to the best of my knowledge and belief and derived from the official records.

[Handwritten Signature]
Deponent

(R. VASUDEVAN)
Director (Civil)
Narmada Control Authority
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INDORE (M.P.)

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INDORE (M.P.)

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Narmada Control Authority
(MoJS, DoWR, RD & GR)
INDORE (M.P.)



नर्मदा नियंत्रण प्राधिकरण

(जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, भारत सरकार)

NARMADA CONTROL AUTHORITY

(Ministry of Jal Shakti, Department of Water Resources, RD & GR, Govt. of India)

नर्मदा सदन, सेक्टर-बी, स्कीम नं., 74-सी, विजय नगर, इन्दौर (म.प्र.)

Narmada Sadan, Sector-B, Scheme No. 74-C, Vijay Nagar, Indore - 452 010 (M.P.), INDIA



No. NCA/Env/2024/149

By Speed Post/Email

Dated 2nd May, 2024

3.

To,

All the concerned Officers,
(As per the list enclosed)

SUB : Minutes of the 3rd Meeting of Committee to review the environmental flow of river Narmada in the downstream of Sardar Sarovar Dam (SSD) – reg.

REF : This office letter No. NCA/Env/2023/91 dated 14th March, 2024.

Sir/ Ma'am,

Please find enclosed herewith a copy of the Minutes of the 3rd Meeting of Committee to review the environmental flow of river Narmada in the downstream of SSD, held on 19th March, 2024 through virtual platform after incorporating the comments received from GoM for kind perusal and needful.

Thanking you,

Yours faithfully,

Encl: As above.

Deyjani Patra
(Deyjani Patra) 2nd May 2024
Member (Env. & Reh.)
Mob. No. 8527484480
Email : mem.er.nca@nic.in

Copy for kind information to:

1. Secretary to the Govt. of India and Chairman, NCA Ministry of Jal Shakti, DoWR, RD & GR, Shram Shakti Bhawan, Rafi Marg, New Delhi. (Email: secy-mowr@nic.in)
2. Vice Chairman, Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.). (Email: vcnvda@mp.gov.in)
3. Managing Director, Sardar Sarovar Narmada Nigam Limited, Govt. of Gujarat, 1st Floor, Block No. 12, New Sachivalaya Complex, Gandhinagar - 382010, Gujarat. (Email: mdssnnl2009@gmail.com)
4. Principal Secretary, Department of Environment & Climate Change, Govt. of Maharashtra, 217 Annex, Opposite to Mantralaya, 2nd Floor, Mumbai-400032, Maharashtra. (Email: psec.env@maharashtra.gov.in)
5. Addl. Chief Secretary, Water Resource Department, Govt. of Rajasthan, Main building, Secretariat, Jaipur-302005, Rajasthan. (Email: osdwr2019@gmail.com)
6. Joint Secretary (Inland Fisheries & Administration), Department of Fisheries, Govt. of India, Room No. 482, 4th Floor, Krishi Bhawan, New Delhi (Email: sagar.mehra@nic.in)



स्वच्छ सुरक्षित जल-सुन्दर खुशहाल कल

CONSERVE WATER - SAVE LIFE

LIST OF ADDRESSEE**Narmada Control Authority**

1. Shri Ashok Kumar Thakur, Executive Member & Chairman of the Committee, NCA, Indore.
2. Member (Civil), NCA, Indore
3. Ms. Devjani Patra, Member (E&R), NCA, Indore.
4. Shri. D. Ilancheziyan, Chief Engineer, NCA, Indore.

National Mission for Clean Ganga (NMCG)

1. Shri Anup Kumar Shrivastava, Executive Director (Technical), National Mission for Clean Ganga, Ministry of Shakti, DoWR, RD&GR, Gol, 1st floor, Major Dhyan Chand National Stadium, India Gate, New Delhi-110001 (Email: ed-technical@nmcg.nic.in)
2. Shri Sandeep Behera, Consultant-Biodiversity, National Mission for Clean Ganga, Ministry of Shakti, DoWR, RD&GR, Gol, 1st floor, Major Dhyan Chand National Stadium, India Gate, New Delhi-110001 (Email: sandeepbehera@nmcg.nic.in/sandeepbehera1967@gmail.com)

Central Water Commission (CWC)

1. Shri N. N. Rai, Director (Hydrology) Dte HSO Unit, Central Water Commission, Sewa Bhawan, R. K. Puram, Sector 1, New Delhi – 110066
(Email:nitya20may@yahoo.co.in/hydne@cwcc.delhi.nic.in/hydsouth@nic.in)

Central Inland Fisheries Research Institute (CIFRI)

1. Dr. B. K. Das, Director, ICAR- Central Inland Fisheries Research Institute, Monirampur (Post), Barrackpore, Kolkata - 700120, West Bengal
(Email:director.cifri@icar.gov.in/director.cifri@gmail.com)
2. Dr. Amiya K Sahoo, Senior Scientist, ICAR- Central Inland Fisheries Research Institute Monirampur (Post), Barrackpore, Kolkata - 700120, West Bengal. (Email: amiya7@gmail.com)

Indian Institute of Technology (IIT), Roorkee

1. Dr. Arun Kumar, Professor, NEEPCO Chair Professor, Hydro & Renewable Energy Department, IIT Roorkee, Roorkee-247667, Uttarakhand.(Email: arun.kumar@hre.iitr.ac.in/ aheciitr.ak@gmail.com)

Government of Madhya Pradesh

1. Member (Engineering), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.).
(Email: memengg@mp.nic.in/memenggnvda@gmail.com)
2. Member (Power), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.).
3. Member (Env. & Forests), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.).
4. Shri Vikram Singh Solanki, Divisional Forest Officer (Monitoring), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59 Arera Hills, Jail Road, Bhopal 462003, (M.P.) (Email: dfom21@gmail.com)

Government of Gujarat

1. Shri G. Ramana Murthy, Additional Principal Chief Conservator of Forests, Environment Cell, Sardar Sarovar Narmada Nagar Nigam Limited, Govt. of Gujarat, Block No. 12, New Sack Complex, Gandhinagar - 382010, Gujarat. (Email: envirementcell@gmail.com)
2. Shri K. A. Keshvani, Chief General Manager (Technical & Coordination), SSNNL, Govt of Gujarat, 1st floor, Block No. 12, New Sachivalaya Complex, Gandhinagar-382010, Gujarat (Email: gm.coor.ssnl@gmail.com/cgmtnc-ssnl@gujarat.gov.in)
3. Shri R.G. Kanungo, Chief Engineer, Dam & Vadodara, Sardar Sarovar Narmada Nagar Nigam Limited, Govt. of Gujarat, 5th Floor, Room No. 501-508, Ekta Nagar-393151, Gujarat. (Email: cedam-ssnl-brd@gujarat.gov.in)
4. Shri. M.K. Chaudhary, Dy. Director (Fisheries), O/o Commissioner of Fisheries, Dr. Jivraj Mehta Bhawan, Block No- 10, 3rd Floor, Old Sachivalaya, Gandhinagar (Gujarat).

Government of Maharashtra

1. Dr. Atul Patne, Commissioner of Fisheries, C-24, 2nd floor, Mittal Tower C-Wing, Nariman Point, near Vidhan Bhavan, Mumbai-400021 Maharashtra (Email: commfishmaha@gmail.com)
2. Shri. Abhay Pimparkar, Director (Environment), Department of Environment & Climate Change, Govt. of Maharashtra, 15th Floor, New Administrative Building, Hutatma Rajguru Chowk, Mantralaya, Mumbai-400032, Maharashtra. (Email: dir.mev-mh@nic.in/envmantra-mh@nic.in)
3. Shri S. S. Khandekar, Superintending Engineer, Dhule Irrigation Project Circle, Sinchan Bhawan, Sakri Road, Dhule – 424001 (Maharashtra) (Email : sedipc.dhulewrd@maharashtra.gov.in)
4. Shri S. D. Khairnar, Executive Engineer, Narmada Development Division (NDD), Narmada Colony, Near G.T.P. College, Khodaimata Road, Nandurbar - 425412, Maharashtra. (Email: ee_narmada@yahoo.co.in)
5. Shri Ravindra B. Wayada, Joint Commissioner (Inland), Nashik Division, Old Ashwini Barrack No.06, Opposite to O/o the Divisional Commissioner, Nashik Road, Nashik-422101, Maharashtra (Email: rdcfnashik@gmail.com)
6. Shri Sanjay P. Wategaonkar, Regional Deputy Commissioner of Fisheries, Nashik Division, Old Ashwini Barrack No. 06, Opposite to O/o the Divisional Commissioner, Nashik Road, Nashik-422101, Maharashtra (Email: wategaonkar.sanjay@yahoo.com/rdcfnashik@gmail.com)
7. Shri Kiran Padvi, Asstt. Commissioner of Fisheries, 17, Kamnath Mahadeo Nagar, Near Aadarsh Hotel, Sakri Road, Nandurbar - 425412, Maharashtra. (Email: acfnandurbar@gmail.com)

Government of Rajasthan

1. Shri Amar Singh, Chief Engineer, Water Resources Department, Govt. of Rajasthan, Lal Sagar, Kishore Bagh Jodhpur-342007 Rajasthan. (Email: s.amar46@gmail.com/cejdr.wr@rajasthan.gov.in/cejdr.wr@gmail.com)
2. Chief Engineer Water Resources Department, Govt. of Rajasthan, Indira Gandhi Nahar Mandal, Bhawani Singh Road, C Scheme, Ashok Nagar, Jaipur-302005, Rajasthan. (Email: ce.wr@rajasthan.gov.in)
3. Shri Shriphal Meena, Additional Chief Engineer, Narmada Canal Project, Sanchore-343041, Distt. Jalore, Rajasthan. (Email: cencpscr@rediffmail.com)



नर्मदा नियंत्रण प्राधिकरण **NARMADA CONTROL AUTHORITY**

सरदार सरोवर परियोजना (एस.एस.पी.) पर नर्मदा नदी के
डाउनस्ट्रीम ई-प्लो पर समिति की तीसरी बैठक का कार्यवृत्त
दिनांक: 19 मार्च, 2024 ऑनलाइन के माध्यम से।

**MINUTES OF 3rd MEETING OF COMMITTEE TO REVIEW
THE ENVIRONMENTAL FLOW OF RIVER NARMADA IN
THE DOWNSTREAM OF SARDAR SAROVAR PROJECT
(SSP) HELD ON 19TH MARCH, 2024 THROUGH VIRTUAL
PLATFORM**

इन्दौर
अप्रैल, 2024

**INDORE
April, 2024**

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MINUTES OF THE 3rd MEETING OF THE COMMITTEE TO REVIEW THE ENVIRONMENTAL FLOW OF RIVER NARMADA DOWNSTREAM OF SARDAR SAROVAR PROJECT (SSP), HELD ON 19 TH MARCH, 2024 AT 11.00 HRS THROUGH VIRTUAL PLATFORM

Introduction

The 3rd Meeting of the Committee, to review the Environmental Flow (E-Flow) of river Narmada downstream (d/s) of SSP, was held on 19th March, 2024 through virtual platform, under the Chairmanship of Shri Ashok Kumar Thakur, Executive Member, NCA. The focus of the meeting was to finalize the Scope of work/Terms of Reference (ToR) of CIFRI, with respect to the re-assessment study of E-Flow in order to protect the downstream riverine environment of river Narmada and Award of study to CIFRI through SSNNL, GoG. List of Officers participated in the meeting is enclosed at **Annex-I**.

At the outset, Executive Member, NCA and Chairman of the Committee welcomed all the participants. Chairman, in his introductory remark stated that during the first meeting of the Committee, held on 21st September, 2023 in Indore, decision was taken for re-assessment of seasonal E-flow to be carried out by GoG through CIFRI, by considering various parameters while in the 2nd Meeting it was decided that CIFRI would prepare Scope of work/ToR, along with names of partner institutions and financial implications for the re-assessment study of E-flow and submit to NCA.

He further stated that the Scope of work/ ToR received from CIFRI was circulated to the Committee Members (**Annex-II**) to obtain the technical views/comments till 07.03.2024. Technical views/ comments received from GoM (**Annex-III**), GoG (**Annex-IV**), GoMP (**Annex-V**) & GoR (**Annex-VI**) vide letters dated 15.02.2024, 04.03.2024, 06.03.2024, 14.03.2024 and 18.03.2024 respectively were circulated among Committee Members.

Further, EM, NCA and Chairman of the Committee reiterated that as per the decision taken during the 94th NCA meeting, and consecutive meetings of the E-flow, the present forum is solely responsible for the process of award of the study to CIFRI and recommending the E-flow quantum. Decision w.r.t. sharing of this revised E-flow Quantum shall be taken at higher level, i.e., in NCA / RCNCA Meetings with the consensus of all the party States.

Chairman of the Committee further stated that the Counsel of NCA, who is defending on behalf of NCA & MoJS, DoWR, RD & GR has conveyed that the Judges of Hon'ble Supreme Court expressed their displeasure against the function of NCA, because the Quantum of E-flow is yet to be decided.

Executive Member, NCA and Chairman of the Committee then requested Member (E&R), NCA to take up the agenda for further deliberation.

Member (E&R), NCA, before taking up the Agenda items for deliberation, clarified to the States that this E-flow Committee is constituted only to assess the quantum of E-Flow and submit its recommendations to the Authority. The study is only to re-assess the quantum of E-Flow to be released from the d/s of SSP/ Garudeshwar Weir. The decision for releasing of E-Flow quantum and water sharing will be taken in the appropriate level, may be in the NCA or RCNCA or during the review of the Award. Arbitrarily, NCA cannot allocate any water without the same getting addressed in the appropriate forum and getting proper consensus from the party States.

Member (E&R), NCA then requested Dr. B.K. Das, Director, CIFRI to share the presentation on the Scope of work/ToR of CIFRI, with respect to the proposal on “*Assessment of Environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of SSD in Narmada River*” and their response to the technical comments/views received from the Committee.

Central Inland Fisheries Research Institute(CIFRI)

Dr. B.K. Das, Director

Dr. B.K. Das before giving his presentation clarified that CIFRI is a scientific and Government organization and the proposed Scope of work for E-flow assessment is based on the ICAR guidelines on Contract/ Consultancy Project. Further, Dr. Das presented the proposal of Scope of work/ToR and the Budget estimate (**Annex-II**) with proposed objectives, study area, methodology, timeline and highlighted the suggestions provided by the party States in details.

He intimated that the proposed study has 3 objectives, which are as follows:-

1. To assess the seasonal hydrological and hydraulics dynamic in the study area.
2. To assess the seasonal habitat requirement (ecology) of the key stone fish species and major fish diversity.
3. To estimate E-flow for fish diversity employing hydraulic rating cum habitat simulation

Briefing on the proposed study area, Dr. Das intimated that study will be carried out between Garudeshwar weir to Bhadbhut Barrage which is about 125 km freshwater zone having 9 stations, viz. Garudeshwar, Poicha, Sisodara, Jhanor, Bharuch, Sakarpura, Bhadbhut, one site between Sisodara & Jhanor and one site between Jhanor & Bharuch, to study on different hydro-biological parameters representing different seasons.

With respect to the proposed Methodology, Director, CIFRI intimated that the field data will be collected by performing field visits, assessment w.r.t. habitat, depth, velocity and discharge will be carried out from boat both manually as well as employing Acoustic Doppler Current Profiler (ADCP). Further, there will be an Experimental fishing, biotic and abiotic sample collection as per the standard operating protocol. The proposed methodology comprehensively includes study of Fish species diversity, migratory species and their reproduction cycle, preparing Habitat preference rating curve for identified fish species, Seasonal dynamics of hydrological and ecological parameters, collection of time series hydrological data and its interpretations.

Moreover, the proposed study also involves survey on the major tributaries of Narmada below SSD and its hydrological contribution, Assessment of Fish based habitat using Hydraulic rating cum habitat simulation method (HECRAS), Assessment through Mike 11 hydrological model with fish habitat requirement, integrating fish habitat-based models for E-flow estimation.

Further, Dr. Das gave point wise reply to the observation of the party States:-

Sl. No.	Comments from States	Replies of CIFRI
1.	Govt. of Rajasthan (Annex-VI) This office is unable to agree suggestions on (CIFRI)'s recommendation regarding mandatory d/s environmental flow (E-flow) in river Narmada from SSD Because share of Rajasthan state will be reduced up to 20%.	<ul style="list-style-type: none"> The comments are not related with the proposed study on “Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of SSD in Narmada River”
2.	Govt. of Madhya Pradesh (Annex-V) अतः उपरोक्तानुसार CIFRI द्वारा प्रेषित उक्त Draft Project Proposal पर मध्यप्रदेश राज्य से अभिमत आवश्यक प्रतीत नहीं होता है। इस संबंध में गुजरात राज्य द्वारा निर्णय लिया जाना उचित होगा।	<ul style="list-style-type: none"> Matters doesn't pertain to the Scope of Work
3.	Govt. of Maharashtra (Annex-III) 1. GoM agrees with cost only. If the rates quoted in item no.6.0 A (1 to 6) are on the basis of current schedule of rates of GoI. Otherwise market rate are assumed in Project Proposal, then it will be appropriate to call for quotations and fix the rates at competent level. 2. According to the opinion of GoM, the Equipments mentioned in item no.6.0 B, should be hired on rental basis as per requirement. 3. According to the opinion of GoM, the overhead cost should be reduced to 10% instead of 20 % on A+B	<ul style="list-style-type: none"> Item no. 6.0 A (1-6) has been prepared as per the ICAR guidelines on Contract/ Consultancy Project Equipment, such as, Biochemical Analyser is not available on rental basis as this is purely laboratory use only. Furthermore, the cost of hiring of Camera and Data Recorder will be almost same as the cost of the equipment. As per the ICAR guidelines, the overhead cost has been fixed to 20 %.

Sl. No.	Comments from States	Replies of CIFRI
4.	<p><u>Govt. of Gujarat (Annex-IV)</u></p> <p>1. The draft ToR provided by CIFRI delineate the study area from the Garudeshwar weir to the Bhadbhut stretch in the Narmada River. Consequently, the d/s segment of the river under consideration for the study, extending from SSD to Bhadbhut Barrage, measures approximately 137 km.</p> <p>In light of this, GoG has recognized the need for a more comprehensive assessment. It is imperative to encompass the entire d/s course of River Narmada from the SSD to its confluence with the Arabian Sea, totaling approximately 162 km.</p> <p>2. The inclusion of the following parameters in the draft proposal is paramount to ensure a comprehensive assessment of the Narmada River ecosystem.</p> <ol style="list-style-type: none"> I. E-Flow w.r.t. Salinity Mitigation II. Water Quality III. Ecological Balance IV. Mangrove Conservation V. Cultural Needs of People VI. Sustaining Aquatic Flora & Fauna including Fish more particularly w.r.t. <ol style="list-style-type: none"> a) Requirement for breeding and migration behavior of Hilsa Fish and b) Upstream movement of Mahaseer (<i>Tor tor</i>) during rainy season <p>Additionally, focusing on sustaining aquatic flora & fauna, especially the breeding and migration behavior of key fish species like the Hilsa Fish and Mahaseer during critical season, further enhances the overall health and resilience of the Narmada River.</p>	<ul style="list-style-type: none"> • As per the 1st and 2nd Meeting of the Committee held on 21st September, 2023 & 17th January, 2024, it was discussed and finalized that the d/s of SSD is extremely critical for E-Flows estimation as different agencies have estimated different figures of discharge/release as well as by adopting different methodologies without considering the biodiversity and river habitat ecology. Therefore, the Committee agreed to estimate the E-Flows only for river ecology and Fisheries within the stipulated period of time (9 months). • Furthermore, it was also highlighted that GoG has planned and started developing the Bhadbhut Barrage which would be completed within a few years. Therefore, the river stretch above the Barrage needs to be estimated for protecting the Freshwater ecology, fisheries and biodiversity. The d/s of the Barrage will be entirely different ecosystem i.e. estuarine ecosystem. Water requirement for salinity mitigation and mangrove require a detailed investigation prior to the estimation of E-Flow. Therefore, the methodology will be significantly different from upstream study and would require a multi-disciplinary team with in depth study which is time consuming. • Therefore, combining the proposed study with this would not solve the objectives as discussed in the two Meetings. • As it has been explained, water requirement and habitat <i>Tor tor</i> and Hilsa are different. Studies to establish their breeding ground and migration required detailed investigations through different approaches.

Sl. No.	Comments from States	Replies of CIFRI
		Therefore, focus on the proposed study would serve the objectives of the main discussion that the Committee did in the meeting. However, social cultural and other requirement for estimation of E-Flow could be taken up separately towards sustainable Narmada ecosystem.

After detailed presentation of Director, CIFRI, Member (E&R), NCA requested the party States to give their comments/views on these issues.

Views of the party States

Govt. of Gujarat

Shri. Ramana Murthy, APCCF stated that views of GoG has already been submitted vide letter No. SSNNL/Env./review/e-flow/21 dated 04.03.2024. Further, Shri K. A. Keshvani, CGM (T&C), SSNNL stated that sometimes back GoG has requested to carry out the study from d/s of SSP to Gulf of Cambay. Again he requested the Committee to carry out the study up to Gulf of Cambay instead of up to Bhadbhut Barrage.

Govt. of Madhya Pradesh

Shri. John Kingsely, Director (Reh.), NVDA intimated that the length of the River Narmada is 1312 km before draining in to Gulf of Cambay. In the first 1,077 km reach, the river flows in Madhya Pradesh, the next 35 km stretch of river forms the boundary between the States of MP and Maharashtra and the next 39 km, it forms the boundary between Maharashtra and Gujarat. The last stretch of 161 km lies in Gujarat.

Proposal for carrying out the studies only in the part of Gujarat for about 161 km d/s of SSP before draining in to Gulf of Cambay will not serve the purpose. Hence, it is suggested that to safeguard the riverine ecology, the study should be carried out for the entire stretch of river Narmada so that the water required for every stage from Amarkantak till the draining in to Gulf of Cambay can be known instead of carrying out the studies for d/s of SSP.

On the other hand, if the concerned States wanted to carry out the studies in their territory, they can do the study without affecting the NWDT Award. If, NCA wanted to carry out the study, in that case, the study should be carried out for the entire Narmada Basin rather than carrying out only in Gujarat territory.

Govt. of Maharashtra

SE, Dhule Irrigation Project Circle (DIPC), Dhule, representative from GoM stated on the proposal submitted by CIFRI (Annex- VII) that if the E-flow is to be calculated and to be released for the whole stretch of Narmada basin, the views of GoMP is correct. However, if the study is to be carried out only for the d/s of SSP, then the final decision on this issues needs approval of higher/Competent Authority, GoM.

In this regard, Member (E&R), NCA again emphasized that the Committee is constituted only to assess the quantum of E-Flow with the help of Expert Members & Institution and submit the same to the Authority. The study is only to re-assess the quantum of E-Flow to be released from the d/s of SSP.

She then requested GoM to give technical views on the proposal submitted by CIFRI. SE, DIPC, Dhule, GoM agreed with the study of E-flow upto Bhadbhut Barrage only from Garudeshwar Weir and not for downstream of Bhadbhut Barrage. He also clearly stated that, for mitigation of d/s salinity, the required water should be used from Bhadbhut Barrage only and not from SSD.

Govt. of Rajasthan

Shri Shreepal Meena, SE, NCP, Sanchore welcomed the study for the e-flow up to Bhadbhut barrage but also indicated that Rajasthan being an arid State, the economy of the three districts Barmer, Jalore and Sanchore (earlier Sanchore was town and now became/declared as district) is totally dependent on this 0.5 MAF of Narmada water. So, he urged that any decision on upward revision should not affect the share of Rajasthan. Further he suggested that GoG may make a provision to store more water during the rainy season/filling period which can be utilized as E-flow rather than relying only from the share of utilizable flow.

After obtaining the views of party States, Member (E&R), NCA requested the Expert Members to give their comments/views on these issues.

Views of Expert Members:**I. Central Water Commission (CWC)****Shri N.N.Rai, Director (Hydrology)**

Shri. N.N.Rai stated that for E-flow assessment for the ecological needs i.e., Fish diversity as decided in the 2nd Meeting of the E-flow Committee, the d/s of SSP up to Bhadbhut Barrage should be carried out instead of going for the whole basin which will take more time. But for the salinity mitigation, mangrove conservation and cultural needs of people the requirement of E-Flow will be entirely different. He further stated that the methodology for assessment of E-flow is still not standardized in the estuarine ecosystem; hence the extended

study area in accordance to GoG is not feasible at present moment. He further added that for assessment of the E-flow HECRAS method is a most appropriate method which can be employed in the present study.

II. IIT, Roorkee

Prof. Dr. Arun Kumar

Dr. Arun Kumar endorsed the views of Director (Hydrology), CWC. After going through the comments received from different States, he stated that E-flow in the river is a necessity which has not been calculated so far for Narmada Basin. Therefore, E-flow should be calculated for the entire Narmada basin.

Dr. Arun Kumar stated that the study be conducted till Bhadbhut Barrage in the first phase and may be extended later to the Sea in the second phase. He also urged to carry out the study as soon as possible because if the Hon'ble NGT issues an order, it might fix a higher quantum of E-flow which will surely affect the water sharing of all party States.

III. National Mission for Clean Ganga (NMCG)

Shri Anup Shrivastava, Executive Director (Technical)

Shri. Anup Shrivastava stated that there is a general agreement for carrying out the studies for the d/s of SSP up to the River draining in to the Gulf of Cambay. He suggested for carrying out the study in entire d/s from SSD till the confluence of river but in phased manner. In the first phase the study should be from Garudeshwar weir to Bhadbhut barrage and in the next phase from Bhadbhut barrage to till the confluence of river in to Gulf of Cambay i.e., the mouth of the River. The upstream study of E-Flow can be carried out from the beginning of river Narmada in another phase.

He further stated that in the present study HECRAS and Mike 11 hydrological Model have been proposed which are one dimensional study method. He suggested carrying out the proposed study employing the HECRAS method so as to avoid confusion with two sets of values.

After detailed discussion Executive Member, NCA and Chairman of the Committee thanked everyone for their views and deliberation on these important issues. Further, he stated that NCA is established for the purpose of securing compliance with and implementation of the decision and directions of the Narmada Water Dispute Tribunal Award. The Committee is taking up the reassessment work as per the decisions of 94th NCA meeting. Views of the NCA comprises of all the States and NCA takes any decision with the consensus of the party States. The proposed study will be carried out by the SSNNL, GoG through CIFRI as decided in the first and second Meeting of E-flow Committee for the d/s of SSP. He further stressed that by this time the study would have been awarded which is still pending.

Moreover, as per the direction of Hon'ble NGT, all States have to maintain a minimum E-Flow in their rivers to protect the riverine ecology and meet the societal needs. The intervening structures on river Narmada cannot be exempted from the regime of E-Flow. Therefore, it is the responsibility of every States to maintain the E- Flow in their territory. GoMP has also to ensure that minimum prescribed E-Flow gets released from their diversion structures erected on River Narmada.

Further, during the second meeting when Member (E&R), NCA, had enquired about the amount of water being released by GoMP in their territory from various dams, like, Bargi, Tawa, ISP, etc., Member(Power), NVDA intimated that these data are available with CWC, Bhopal and the same can be obtained from them.

Even though, if all the States agreed to carry out the study for the whole basin and the expert Members also suggest for the same, it is acceptable to the Committee. But at the same time, it is a lengthy process and to complete the study for the whole basin more time is required. But the present case is already in the Hon'ble NGT to release the downstream E-Flow from SSD. If the issue is not settled at the right time, as informed by the Expert Members, Hon'ble NGT may issue a direction to release the E-flow which may be on the higher side. Then, every States will have to follow the direction of Hon'ble NGT and accordingly each States has to release the water to safeguard the riverine ecology of the River Narmada.

Keeping in view, if all the States agree for reassessment of E-flow for the downstream of SSP, the same will be awarded to CIFRI .Else, if the studies are required for whole basin or till the sea, then the issue will be put up in NCA meeting and as per the directions of the Authority further action can be taken. He then requested the party States to give their final views on this issue for taking decision.

Member (E&R), NCA stated that as discussed in the earlier Meeting in the first phase the study would be given for the d/s of SSP. For the upstream of SSP, as decided in the first meeting GoMP will take up the study in their territory separately.

Further Member (E&R), NCA enquired from CIFRI that if the study is extended for another 25 km from Bhadbhut barrage to the mouth of the river whether the study period will increase, methodology will change and the estimate will increase.

In response to above, Dr. Amiya Sahoo, Senior Scientist, CIFRI stated that as per decision taken in first and second Meeting of the E-Flow Committee, the study area is restricted from Garudeshwar weir to Bhadbhut Barrage. The entire 20-25 km areas d/s to Barrage is an estuarine zone with wider mouth, which has different cross section and hydraulic parameters.

Dr. Amiya Sahoo emphasized that keeping in view the technical and scientific constraints, currently the study can be initiated up to Bhadbhut Barrage in the first phase.

Shri N.N. Rai, Director (Hydrology), CWC agreed with the views of Dr. Amiya Sahoo. He stated that the estuarine ecosystem is entirely different. Therefore, in the initial phase, the study may be considered up to Bhadbhut Barrage. As Bhadbhut barrage is under construction, study will be required up to the Barrage. At this stage the study area of estuarine ecosystem should not be considered along with fresh water ecosystem. Referring the issues being faced while computing the E-Flow for estuarine ecosystem of Mahanadi, Director, CWC suggested to go for the fresh water ecosystem i.e. up to Bhadbhut barrage.

Dr. Arun Kumar, Professor, IIT Roorkee also endorsed the views of Shri N.N. Rai, suggesting to get the proposed study done up to Bhadbhut Barrage initially and then from Bhadbhut Barrage to mouth of the river in the next phase.

Shri R.G. Kanungo, CE (Dam & Vadodara), SSP in reference to the Member (E&R)'s enquiry on the status on construction of Bhadbhut barrage stated that about 40% of works has been completed. Then Member (E&R) informed that since the construction of Bhadbhut barrage as already started in 2020 and going to be completed by 2026, the present E-flow study from Garudeshwar Weir be confined upto Bhadbhut barrage only, which is a practice in cascade projects.

Shri Ramana Murthy, APCCF, GoG intervened and stated that MD, SSNNL in the recent past convened an internal meeting along with the officers from Kalpasar Department, wherein it was decided that an integrated study should be carried out for the entire stretch d/s rather than up to Bhadbhut Barrage for comprehensive assessment to effectively mitigate salinity levels, address the cultural needs of people and to preserve mangrove habitats.

He further stated that in 2012, it was also decided that whatever the quantum of E- flow is released from SSP, the same quantum will be released from Bhadbhut Barrage up to mouth of the river. Therefore, the study should be considered for comprehensive assessment of E-Flow up to mouth of the river with reasonably compromising some of the study parameters.

During discussion Shri Ramana Murthy, APCCF, GoG enquired whether the E-flow is/not required for the d/s of Bhadbhut Barrage. And if required, the stretch below the Bhadbhut barrage can be considered for computing E-flow to some extent by compromising some parameters.

In view of the above, Member (E&R) NCA suggested that in first phase the study may be assigned to CIFRI up to Bhadbhut Barrage as CIFRI has already submitted the proposal for the first phase. In the second phase the extended area below the Bhadbhut may be considered. In this regard, Shri.Ramana Murthy, APCCF informed that approval of Competent Authority is required for assigning the work for the first phase, i.e., up to Bhadbhut Barrage.

SE, DIPC, Dhule, GoM had stated that opinion of other party States is also required for carrying out the studies as suggested by Member (E&R) as above. He further stated that as

informed by the Expert Members the area under consideration for E-flow study has two ecosystem, different catchment and hydrological parameters. The E- flow requirement below the Bhadbhut Barrage will be met out from the water stored in Bhadbhut Barrage.

Therefore, as suggested by Expert Members in the first phase the study can be considered from Garudeshwar weir to Bhadbhut barrage as proposed by CIFRI, the second phase from Bhadbhut till the Gulf of Cambay can be considered later as this would involve more complicated study, involving an array of parameters to address wide river mouth and its estuarine zone.

After the views and comments of the Members of the Committee, in order to converge on the issue, EM, NCA and Chairman of the Committee called for the final views from the party States. SE, DIPC, Dhule, GoM and GoR agreed to the proposal of the study up to Bhadbhut barrage only while GoG suggested to extend the study area up to mouth of the river. However, GoMP representative did not comment on this.

As there was no consensus among the party States, EM, NCA & Chairman of the Committee desired that the issues will be put up for the directions of the Authority in the next NCA Meeting.

Meeting ended with a vote of thanks to the Chair.

ANNEXURE

**LIST OF PARTICIPANTS OF THE 3rd MEETING OF E-FLOW COMMITTEE HELD
ON 19TH MARCH, 2024 THROUGH VIRTUAL PLATFORM**

NARMADA CONTROL AUTHORITY

1. Shri Ashok Kumar Thakur, Executive Member & Chairman of the Committee
2. Ms. Devjani Patra, Member (E&R)
3. Shri D. Ilanchezhiyan, Chief Engineer
4. Shri R. Vasudevan, Director (Civil)
5. Shri Deepak Malviya, Dy. Director (Civil)
6. Dr. Nihal Gujre, Project Coordinator
7. Ms. Anjali Singh, J.R.F.

NATIONAL MISSION FOR CLEAN GANGA (NMCG), DELHI

8. Shri Anup Shrivastava, Executive Director (Technical)

CENTRAL WATER COMMISSION (CWC), DELHI

9. Shri N. N. Rai, Director (Hydrology)

CIFRI, BARRACKPORE

10. Dr B. K. Das, Director
11. Dr Amiya K. Sahoo, Senior Scientist

IIT, ROORKEE

12. Dr. Arun Kumar, NEEPCO Chair Professor, Hydro & Renewable Energy Dept.

GOVT. OF MADHYA PRADESH

13. Shri John Kingsley, Director (Reh.) NVDA
14. Shri Vikram Singh Solanki, Dy. Forest Officer, NVDA

GOVT. OF GUJARAT

15. Shri G. Ramana Murthy, APCCF, SSNNL
16. Shri K. A. Keshvani, CGM (T&C), SSNNL
17. Shri Kanungo, Chief Engineer, SSP
18. Shri R. J. Shah, Executive Engineer, SSNNL

GOVT. OF MAHARASHTRA

19. Shri S. S. Khandekar, Superintending Engineer, WRD
20. Shri Abhay Pimparkar, Director (Environment)
21. Shri S.P. Wategaonkar, Regional Dy. Commissioner Fisheries, Nashik Division, Nashik
22. Shri Sanjay Khairnar, Executive Engineer, NDD, Nandurbar
23. Shri Kiran Padvi, Asstt. Commissioner (Fisheries), Nandurbar

GOVT. OF RAJASTHAN

24. Shri Shreepal Meena, SE, WRD, Sanchore

Proposal on E-flow in the downstream of SSD/Garudeshwar Weir – reg**-13 & 14-**

1 message

Anil R <ps-mem-nca@gov.in>

Fri, Feb 9, 2024 at 4:58 PM

To: Executive Member NCA <exe.mem.nca@nic.in>, Dr T R Nayak <memc.nca@gov.in>, Member Env and Rehab NCA <mem.er.nca@nic.in>, Anup Kumar Srivastava <ed-technical@nmcg.nic.in>, SandeepBehera Consultant <sandeepbehera@nmcg.nic.in>, sandeepbehera1967 <sandeepbehera1967@gmail.com>, nitya20may <nitya20may@yahoo.co.in>, hydne <hydne@wc.delhi.nic.in>, "Hydrology(S), CWC" <hydsouth@nic.in>, director cifri <director.cifri@icar.gov.in>, director cifri <director.cifri@gmail.com>, amiya7 <amiya7@gmail.com>, arun kumar <arun.kumar@hri.iit.ac.in>, aheciitr ak <aheciitr.ak@gmail.com>, memengg <memengg@mp.nic.in>, memenggnvda <memenggnvda@gmail.com>, dfom21 <dfom21@gmail.com>, envirmntcell <envirmntcell@gmail.com>, gm coor ssnl <gm.coor.ssnl@gmail.com>, cgmtnc-ssnl <cgmtnc-ssnl@gujarat.gov.in>, s amar46 <s.amar46@gmail.com>, cejdr wr <cejdr.wr@rajasthan.gov.in>, cejdr wr <cejdr.wr@gmail.com>, ce wr <ce.wr@rajasthan.gov.in>, commfishmaha <commfishmaha@gmail.com>, dir.mev-mh@nic.in, sedipc dhulewrd <sedipc.dhulewrd@maharashtra.gov.in>, ee narmada <ee_narmada@yahoo.co.in>, rdcfnashik <rdcfnashik@gmail.com>, wategaonkar sanjay <wategaonkar.sanjay@yahoo.com>, acfnandurbar <acfnandurbar@gmail.com>

Cc: Debashree Mukherjee <secy-mowr@nic.in>, mdssnl2009 <mdssnl2009@gmail.com>, I C P Keshari <vcnvda@mp.gov.in>, sec forest <sec.forest@maharashtra.gov.in>, psec env <psec.env@maharashtra.gov.in>, osdwr2019 <osdwr2019@gmail.com>, Sagar Mehra <sagar.mehra@nic.in>

Respected Sir/Madam

Please find attached herewith a letter dated 9th February, 2024 from Member (E&R), NCA enclosing therewith the draft project proposal on *“Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada river”*, submitted by CIFRI, vide its letter dated 8th February, 2024, for furnishing **technical** views/comments positively by **7th March, 2024** to NCA on the proposal.

--

With regards

PS to Member (E&R)
Narmada Control Authority
(MoJS, DoWR, RD & GR)
Narmada Sadan, BG Sector
Scheme No. 74 Vijay Nagar
Indore - 452 010, M.P.
Tel : 0731-2554333

2 attachments **NCA Env 2023 50 2024 02 09 letter from Member (E&R).pdf**

389K

 **CIFRI Project E-flows NCA 08-02-2024.pdf**

925K



नर्मदा नियंत्रण प्राधिकरण

(जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, भारत सरकार)

NARMADA CONTROL AUTHORITY



(Ministry of Jal Shakti, Department of Water Resources, RD & GR, Govt. of India)

नर्मदा सदन, सेक्टर-बी, स्कीम नं., 74-सी, विजय नगर, इन्दौर (म.प्र.)

Narmada Sadan, Sector-B, Scheme No. 74-C, Vijay Nagar, Indore - 452 010 (M.P.), INDIA

No. NCA/Env/2023/ 50

By Speed Post/Email
February 9, 2024

To,

All the concerned Officers,
(As per the list enclosed)

SUB : Proposal on E-flow in the downstream of SSD/Garudeshwar Weir – reg.

REF : This office letter No.NCA/Env/2023/23, dated 19th January, 2024.

Sir/ Ma'am,

In pursuance to the decisions taken in the second meeting of E-flow Committee, to review the environmental flow of river Narmada in the downstream of Sardar Sarovar Dam/Garudeshwar Weir, held on 17th January, 2024 through virtual platform, please find enclosed herewith the draft project proposal on "Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada river", submitted by CIFRI, vide its letter dated 8th February, 2024.

You are kindly requested to peruse the same and furnish your **technical** views/comments positively by **7th March, 2024** to NCA. A meeting in this regard is scheduled to be held on **15th March, 2024** to finalise the proposal for Award to CIFRI through SSNNL.

Thanking you,

Yours faithfully,

Encl: As above.

(Devyani Patra)

Member (Env. & Reh.)

Mob. No. 8527484480

Email : mem.er.nca@nic.in

Copy for kind information to:

1. Secretary to the Govt. of India and Chairman, NCA, Ministry of Jal Shakti, DoWR, RD & GR, Shram Shaka Bhawan, Rafi Marg, New Delhi (Email: secy-mowr@nic.in).
2. Managing Director, Sardar Sarovar Narmada Nigam Limited, Govt. of Gujarat, 1st Floor, Block No. 12, New Sachivalaya Complex, Gandhinagar - 382010, Gujarat (Email: mdssnnl2009@gmail.com).
3. Vice Chairman, Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.) (Email: vcnvda@mp.gov.in).
4. Principal Secretary, Revenue & Forest Department, Govt. of Maharashtra, Room No.103, Mantralaya, Madam Cama Marg, Hutatma Rajguru Chowk, Mumbai – 400 032 (Maharashtra) (Email : sec.forest@maharashtra.gov.in)
5. Principal Secretary, Department of Environment & Climate Change, Govt. of Maharashtra, 217 Annex, Opposite to Mantralaya, 2nd Floor, Mumbai-400032, Maharashtra. (Email: psec.env@maharashtra.gov.in)
6. Addl. Chief Secretary, Water Resource Department, Govt. of Rajasthan, Main building, Secretariat, Jaipur-302005, Rajasthan. (Email: osdwr2019@gmail.com)
7. Joint Secretary (Inland Fisheries & Administration), Department of Fisheries, Govt. of India, Room No. 482, 4th Floor, Krishi Bhawan, New Delhi (Email: sagar.mehra@nic.in)



LIST OF ADDRESSEE**Narmada Control Authority**

1. Shri Ashok Kumar Thakur, Executive Member & Chairman of the Committee, NCA, Indore.
2. Dr. Tejram Nayak, Member (Civil), NCA, Indore.
3. Ms. Devjani Patra, Member (E&R), NCA, Indore.

National Mission for Clean Ganga (NMCG)

1. Shri Anup Kumar Srivastava, Executive Director (Technical), National Mission for Clean Ganga, Ministry of Jal Shakti, DoWR, RD&GR, Gol, 1st floor, Major Dhyan Chand National Stadium, India Gate New Delhi-110001 (Email: ed-technical@nmcg.nic.in)
2. Shri Sandeep Behera, Consultant (Biodiversity), National Mission for Clean Ganga, Ministry of Shakti, DoWR, RD&GR, Gol, 1st floor, Major Dhyan Chand National Stadium, India Gate, New Delhi-110001 (Email: sandeepbehera@nmcg.nic.in/sandeepbehera1967@gmail.com)

Central Water Commission (CWC)

1. Shri N. N. Rai, Director (Hydrology) Dte HSO Unit, Central Water Commission, Sewa Bhawan, R. K. Puram, Sector 1, New Delhi – 110066
(Email: nitya20may@yahoo.co.in/hydne@cwcdelhi.nic.in/hydsouth@nic.in)

Central Inland Fisheries Research Institute (CIFRI)

1. Dr. B. K. Das, Director, ICAR- Central Inland Fisheries Research Institute, Monirampur (Post), Barrackpore, Kolkata - 700120, West Bengal (Email: director.cifri@icar.gov.in/director.cifri@gmail.com)
2. Dr. Amiya K Sahoo, Senior Scientist, ICAR- Central Inland Fisheries Research Institute Monirampur (Post), Barrackpore, Kolkata - 700120, West Bengal. (Email: amiya7@gmail.com)

Indian Institute of Technology (IIT), Roorkee

1. Dr. Arun Kumar, Professor, NEEPCO Chair Professor, Hydro & Renewable Energy Department, IIT Roorkee, Roorkee-247667, Uttarakhand. (Email: arun.kumar@hre.iitr.ac.in/aheciitr.ak@gmail.com)

Government of Madhya Pradesh

1. Member (Engineering), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.).
(Email: memengg@mp.nic.in/memenggnvda@gmail.com)
2. Member (Power), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59, Arera Hills, Jail Road, Bhopal - 462003, (M.P.).
3. Shri Vikram Singh Solanki, Divisional Forest Officer (Monitoring), Narmada Valley Development Authority, Govt. of Madhya Pradesh, Narmada Bhawan, 59 Arera Hills, Jail Road, Bhopal 462003, (M.P.) (Email: dfom21@gmail.com)

Government of Gujarat

1. Shri G. Ramana Murthy, Additional Principal Chief Conservator of Forests, Environment Cell, Sardar Sarovar Narmada Nagar Nigam Limited, Govt. of Gujarat, Block No. 12, New Sack Complex, Gandhinagar - 382010, Gujarat. (Email: envirementcell@gmail.com)
2. Shri K. A. Keshvani, Chief General Manager (Technical & Coordination), SSNNL, Govt of Gujarat, 1st floor, Block No. 12, New Sachivalaya Complex, Gandhinagar-382010, Gujarat (Email: gm.coor.ssnl@gmail.com/cgmtnc-ssnl@gujarat.gov.in)
3. Shri M.K. Chaudhary, Dy. Director (Fisheries), O/o Commissioner of Fisheries, Dr. Jivraj Mehta Bhawan, Block No-10, 3rd Floor, Old Sachivalaya, Gandhinagar (Gujarat)

Government of Rajasthan

1. Shri Amar Singh, Chief Engineer, Water Resources Department, Govt. of Rajasthan, Lal Sagar, Kishore Bagh Jodhpur-342007 Rajasthan. (Email: s.amar46@gmail.com/cejdr.wr@rajasthan.gov.in/cejdr.wr@gmail.com)
2. Chief Engineer Water Resources Department, Govt. of Rajasthan, Indira Gandhi Nahar Mandal, Bhawani Singh Road, C Scheme, Ashok Nagar, Jaipur-302005, Rajasthan. (Email: ce.wr@rajasthan.gov.in)

Government of Maharashtra

1. Dr. Atul Patne, Commissioner of Fisheries, C-24, 2nd floor, Mittal Tower C- wing, Nariman Point, near Vidhan Bhavan, Mumbai-400021 (Maharashtra) (E-mail : commfishmaha@gmail.com)
2. Director (Environment), Department of Environment & Climate Change, Govt. of Maharashtra, 15th Floor, New Administrative Building, Hutatma Rajguru Chowk, Mantralaya, Mumbai-400002, Maharashtra. (Email: dir.mev-mh@nic.in)
3. Shri S.S.Khendekar, Superintending Engineer, Dhule Irrigation Project Circle, Sinchan Bhawan, Sakri Road, Dhule – 424 001 (Maharashtra) (Email : sedipc.dhulewrd@maharashtra.gov.in)
4. Shri S. D. Khairnar, Executive Engineer, Narmada Development Division (NDD), Narmada Colony, Near G.T.P. College, Khodaimata Road, Nandurbar - 425412, Maharashtra. (Email: ee_narmada@yahoo.co.in)
5. Shri Ravindra B. Wayada, Joint Commissioner (Inland), Nashik Division, Old Ashwini Barrack No.06, Opposite to O/o the Divisional Commissioner, Nashik Road, Nashik-422101, Maharashtra (Email: rdfnashik@gmail.com)
6. Shri Sanjay P. Wategaonkar, Regional Deputy Commissioner of Fisheries, Nashik Division, Old Ashwini Barrack No. 06, Opposite to O/o the Divisional Commissioner, Nashik Road, Nashik-422101, Maharashtra (Email: wategaonkar.sanjay@yahoo.com/rdfnashik@gmail.com)
7. Shri Kiran Padvi, Asstt. Commissioner of Fisheries, 17, Kamnath Mahadeo Nagar, Near Aadarsh Hotel, Sakri Road, Nandurbar - 425412, Maharashtra. (Email: acfnandurbar@gmail.com)

भाकृअनुप-केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान

आई एस ओ 9001:2015 प्रमाणित संगठन
(भारतीय कृषि अनुसंधान परिषद्)
बैरकपुर, कोलकाता - 700120 (पश्चिम बंगाल)



ICAR-Central Inland Fisheries Research Institute

An ISO 9001:2015 Certified Organization
(Indian Council of Agricultural Research)
Barrackpore, Kolkata -700120, West Bengal

डा. बसंत कुमार दास, निदेशक
Dr. Basanta Kumar Das, Director

F. No. CIFRI (Proj.) - 51/NCA(I)/2024 - D. Cell

Dated 08th February, 2024

To,

The Member (Env. & Reh.)
Narmada Control Authority,
Narmada, Sadan, Sector-B, Vijay Nagar, Indore, (M.P.), 452010

Sub.: Submission of project proposal on E-flows in the downstream of SSD.

Ref. no. NCA/Env/2023/23 dated 19th January 2024

Madam,

Inviting reference to the above, I am enclosing herewith the project proposal on "Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada river". The project proposal includes the scope of the work, methodology and budget for carrying out the study between SSD and Bhadbhud stations. The proposal was prepared considering the expert opinions from CWC, IITR and NMCG. This is for your review and necessary actions.

Yours sincerely,


(B. K. Das)

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Project Proposal on

Assessment of Environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada river



Submitted by



ICAR-CENTRAL INLAND FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
BARRACKPORE, KOLKATA -700120, West Bengal

Title:

Assessment of Environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada river

Project Duration:

9 months (March-November 2024) (Lean/Pre-monsoon and Post-monsoon)

Project Details:***1.0 Background:***

Sardar Sarovar Dam (SSD), a multipurpose Dam is on the mainstream of river Narmada and is about 162 km from the estuarine mouth. This Dam has FRL 138.68 m with a large network of canals. The dam attracts greater ecological concern since the downstream stretch of the Dam has vast fisheries potential which is liable to be impacted owing to prioritized use of stored water upstream, leading to freshwater crunch at downstream. Furthermore, the Kalpasar Department, Government of Gujarat has proposed to construct a barrage across the river Narmada near Bhadbhut village, Gujarat, which is planned at 25 km upstream of the river mouth. Therefore, the downstream of SSD is now restricted to 137km only freshwater.

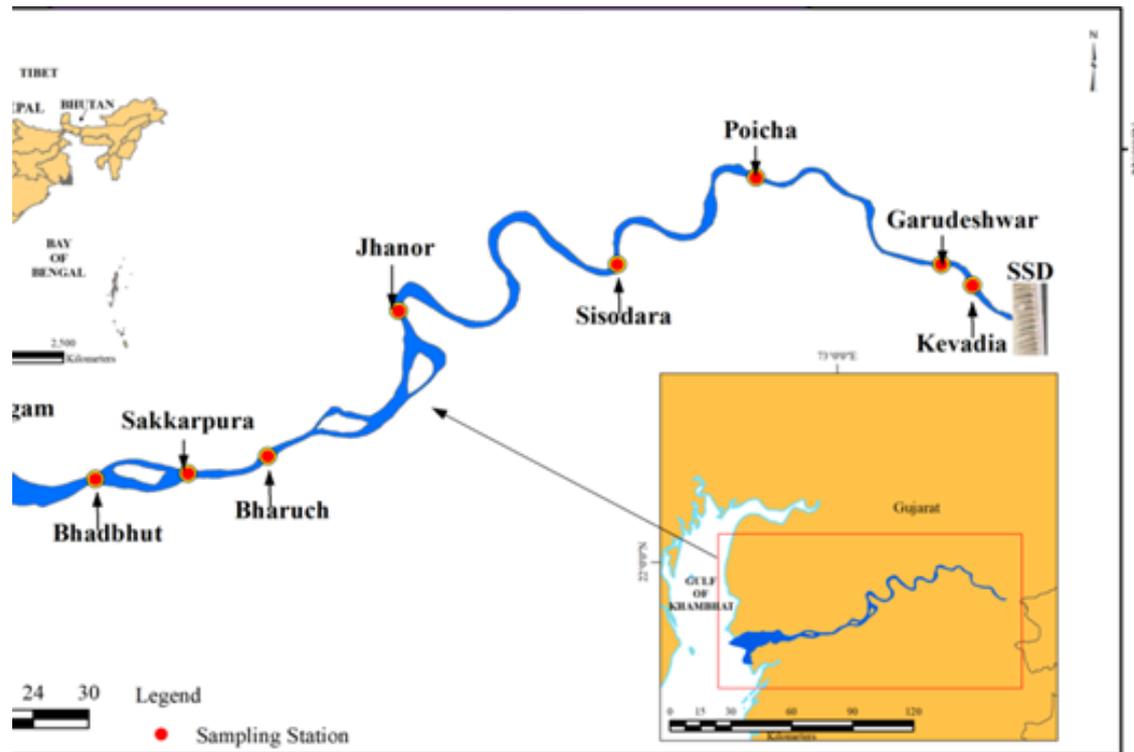
Environmental flows in rivers has been considered as one of the top priorities towards river biodiversity and habitat conservation. In addition, depending on the societal needs the environmental flows becomes more challenging. Looking into the river morphology, few studies on the environmental flows assessment have been made on river Narmada below the SSD. The M.S. University, Vadodara estimated 45 cumecs (1590 cusecs); CWPRS, Pune estimated 30 cumecs (1060 cusecs) and HR Wallingford, London has estimated as 28.30 cumecs (1000 cusecs) of minimum environmental flow to be released d/s to the dam so that salinity ingress is checked, riverine ecology and societal needs are protected. However, these estimates are not directly addressed to the fish species, which is considered as the indicators of river health and biodiversity conservation. During the 41st Environment Sub Group (ESG) meeting held in 2005, Govt. of Gujarat specified that their studies indicate that 600 cusecs would be adequate for maintaining environment flow downstream of SSD. Hence this Sub-Group decided that a minimum constant discharge of 600 cusecs of water be maintained downstream of SSD, which is being maintained through Godbole Weir in Dyke No. 3 of Sardar Sarovar Project. These 600 cusecs of water, when supplemented by the water released after generation of power from the River Bed Power House, was found sufficient to maintain the

ecology and environment in the downstream reach of Sardar Sarovar Dam. But due to drought/deficient river yield during 2017-2018, River bed Power House could not be operated and this 600cusec water was found insufficient and there have been a number of representations to increase this environment flow quantum. For instance, a petition was also filed before the Hon'ble NGT for enhancing the quantum of e-flow. Hon'ble NGT directed the petitioners to approach Narmada Control Authority, however, instead of doing so, the petitioners had filed a Writ Petition before the Hon'ble Supreme Court. As a result, it was decided to assess the environmental flow, downstream to SSD. On request of SSNNL, ICAR-CIFRI submitted a study report titled "Environmental flows for river ecology with focus on d/s fisheries of SSD in Narmada River" and estimated E-Flow of 1875 cusecs during the lean period (February to May), 14401 cusecs during Monsoon (June to September) and 5753 cusecs during Post-Monsoon (October to January) in the stretch between SSD and Garudeshwar weir. Furthermore, ICAR-CIFRI also mentioned that due to Garudeshwar weir, the upstream will be a lentic (stagnant) ecosystem in nature. Thus, the E-Flow requirement between d/s of SSD and Garudeshwar weir is not essential as it has already become a pool due to obstruction created by this weir. However, it is highly essential to estimate the E-Flows below Garudeshwar weir and therefore, during 1st and 2nd E-flow Meetings, held on 21st September 2023 and 17th January, 2024, NCA with consent from the all the party states and expert opinions from CWC, IIT Roorkee and NMCG, has decided to re-assess the environmental flow below SSD to Bhadbhut in the river Narmada. With this backdrop, the proposal is planned to work on the following objectives

2.0 Objectives:

1. To assess the seasonal hydrological and hydraulics dynamic in the study area.
2. To assess the seasonal habitat requirement (ecology) of the key stone fish *species* and major fish diversity
3. To estimate E-flow for fish diversity employing hydraulic rating cum habitat simulation method.

3.0 Study area



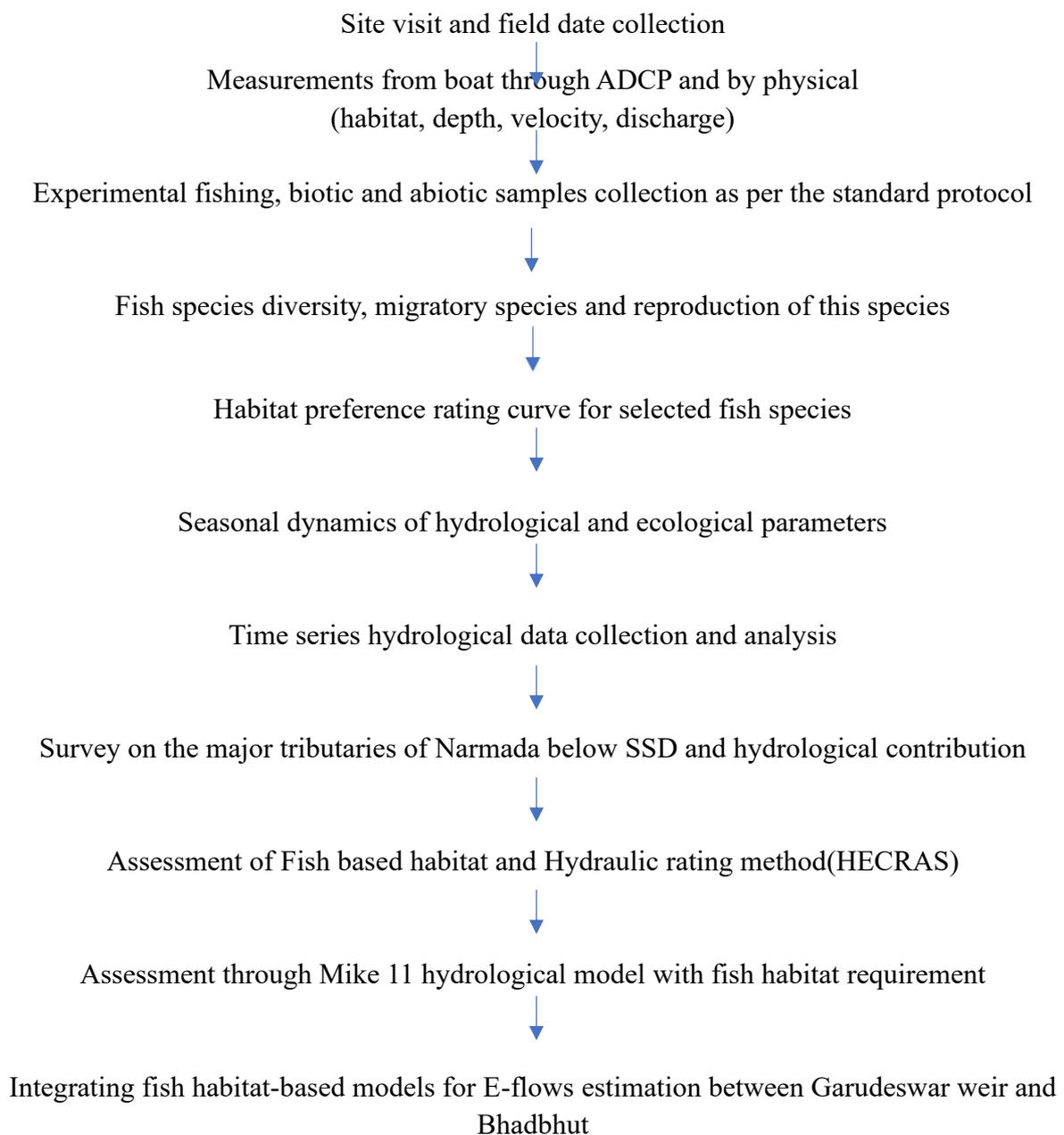
The study will be carried out between the Garudeswar weir to Bhadbhut stretch in river Narmada (162 km). Total -9 stations (Garudeswar, Poicha, Sisodara, Jhanor, Bharuch, Sakkarpura and Bhadbhut and additional one site between Sisodara and Jhanor and one site between Jhanor and Bharuch) will be selected to study on different hydro-biological parameters representing different seasons.

4.0 Work plan

1. River cross sections at the selected sites at different seasons, river discharge, depth and water velocity will be surveyed through ADCP to understand the current hydrological discharge, and river habitat.
2. Seasonal hydrological and biological/ecological parameters assessment and data analysis will be made.
3. Focus on identification of key fish species i.e migratory indigenous fish species and studies on their migratory pattern with reproduction.
4. Developing fish species specific criteria for e-flows estimation including the depth and velocity requirement.
5. Analysis of the 10 daily historical time series of stream-flow in the selected stretches.

6. Hydrologic characteristics will be identified for the preliminary E-Flows reaches. Annual hydrographs were constructed, for both naturalized (near-natural) and present-day conditions, through hydrological modelling process, to show changes in flow over the year at a specific location.
7. Hydraulic rating cum habitat simulation method (HECRAS model), and the fish biology (e.g., adaptable water depth and velocity for its migration, spawning) will be accessed for e-flows estimation.

4.0 Methodology:



5.0 Activities and Time line

Objectives	Activities	Mar/Apr (Lean)	May/Jun (Pre- monsoon)	Sep/Oct (Post- monsoon)	Nov/Dec
To investigate on current seasonal dynamics of hydrological, hydraulics and ecological including fish diversity in the selected stretches from downstream of SSD to Bhadbhut.	1.Survey on hydrology, river cross sections				
	2.Fish diversity and reproductive study				
	3.River habitat and ecological assessment				
	4.Collection of secondary data from the respective states Departments/SSNNL				
	5.Seasonal data compilation and analysis for inferring the life stages and migratory period and water requirement				
To estimate the fish habitat based environmental flows requirement in the downstream of the Garudeswar weir to Bhadbhut.	1.Time series hydrological data collection and analysis				
	2.Habitat preference curve for the key fish species				
	3.HECRAS model based simulation considering the selected fish depth				
	4.MIKE11 hydrological model with considering desired fish depth and velocity				
	5.Integrating the fish based models for the environmental flows analysis				
Analysis and Report preparation			First site visit report		Final

6.0 Project Cost and Budget

The costing of project implementation is based on the standard rules and guidelines laid down by ICAR for consultancy services:

Sl. No	Particulars	Unit Rate	Total Amount	
A) Recurring Cost				
1	Cost of Man days of staff deployed			
	Institution Head (Coordinator)	15 days @ Rs. 6000/-	90,000	
	Scientist/Senior Scientist	30 days @ Rs. 4000/- x 3 No	3,60,000	
	Technical staff	50 man days @ 2000/- x 1 No	1,00,000	
				5,50,000
2	External Payments			
	Young Professional II (1 No)	Rs. 42000 x 9 months	3,78,000	
	Young Professional I (1 No)	Rs. 35000 x 9	3,15,000	
	Skilled Technical (2 no)	Rs.25,000 x9	4,50,000	
				11,43,000
	External payment in terms of hiring Subject based professionals with Bachelor's and Masters degree as YPI and YPII is highly essential for seasonal sample collection, analysis of biological and hydrological data, ADCP operation on field,			
4	TA & DA		3,50,000	3,50,000
5	Contingencies (Operational)		3,00,000	
	Outsourcing/Data designing		2,00,000	
	Vehicle hiring		3,00,000	
	Experimental fishing/Fish/Hiring boat (9 sites)		2,00,000	
	Consumables (chemicals, glass wares, plastic wares, etc.)		1,00,000	
				11,00,000
6	Intellectual fee (as per ICAR guideline)			5,50,000
				36,93,000
B) Cost of physical inputs/Capital cost				
1	Equipment (Field data recorder/Camera/Biochemical analyser)			7,00,000
C	Overhead Cost @ 20 % on A + B			8,78,600
D	GST @ 18% on Consultancy cost (A+C)			8,22,888
Total Cost (A + B + C + D)				60,94,488

7.0 Deliverables:

Three season E-flow data for survival and propagation of keystone fish species and maintaining downstream ecology along with justifications and modelling for e-flow calculations.

8.0 Project Team:

Project Co-ordinator: Dr.B.K.Das, Director

Project Investigator: Dr.A.K.Sahoo, Senior Scientist, ICAR-CIFRI, Barrackpore

Project Co-Investigators: Dr. S. Kamble, Senior Scientist, Vadodara ICAR-CIFRI Centre

Dr.D.K.Meena, Senior Scientist, ICAR-CIFRI, Barrackpore

Dr. Ajoy Saha, Senior Scientist, ICAR-CIFRI, Barrackpore

811

-27-



Dhule Irrigation Project Circle, Dhule

Sinchan Bhavan, Sakri Road, Dhule 424001

Web Site :-www.nipcdhule.com	Fax No. 02562-276663
Email :- sedipc.dhulewrd@maharashtra.gov.in	Tel. No. 02562-276659
No./DIPC/PB-4/ 651 /2024	Date :- 15 / 02 /2024

To,

**The Chief Engineer,
Tapi Irrigation Development
Corporation, Jalgaon.**

Subject :- Comments on proposal E-Flow in the downstream of SSD/Garudeshwar weir -reg.

Reference:- 1) Narmada Control Authority's Letter No.NCA/Env./2023/50 Date 9th February, 2024.
2) Executive Engineer, Narmada Development Division, Nandurbar letter No./NDDN/PB-1/246/2024, Dt. 14/02/2024

With reference to letter and subject cited above, Comments are submitted herewith on Project Proposal, regarding E-Flow in the downstream of SSD/Garudeshwar weir as submitted by CIFRI to NCA, for your kind information and further needful please.

In this regard it is to submit that, GoM will have to pay the share cost amount for the work as proposed in CIFRI's proposal. Therefore it is requested to communicate this proposal to GoM for favor of Information and further necessary action please.

DA :- As Above

OC sign by SE

(P. G. Patil)

**Dy. Superintending Engineer
Dhule Irrigation Project Circle
Dhule**

Copy to:- Copy Respectfully Submitted to the Member (Env.& Reh.), Narmada control Authority, Narmada Sadan, Sector-B, Scheme no. 74-C, Vijay Nagar, Indore (MP)-452-010 for favor of Information please. (DA as above)

Copy to:- Executive Engineer, Narmada Development Division, Nandurbar for information and necessary action. (DA as above)

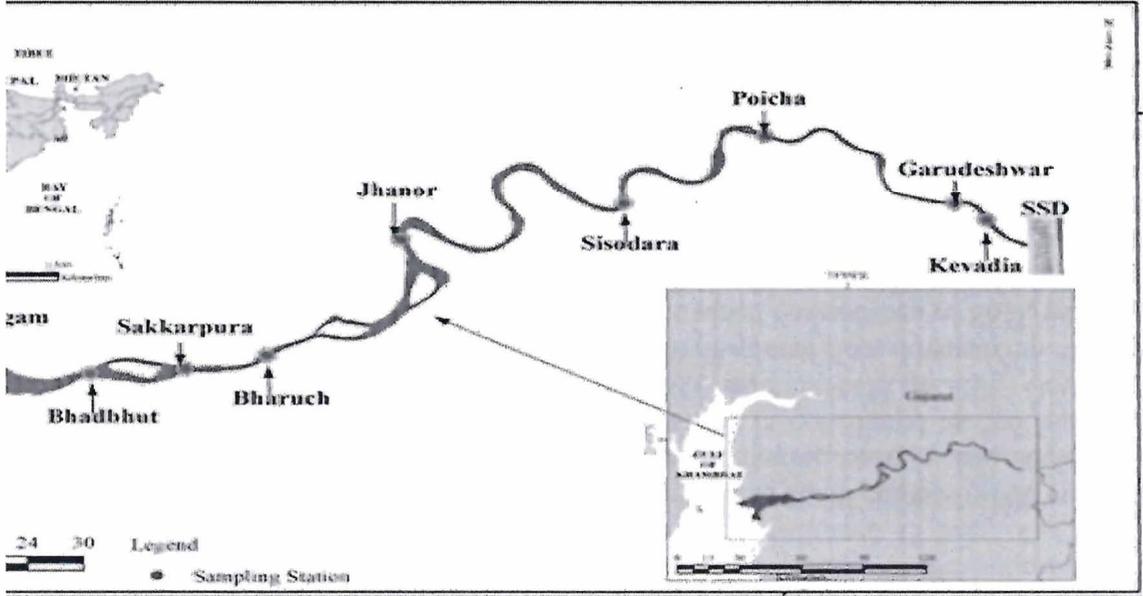
**COMMENTS ON PROJECT PROPOSAL ON ASSESSMENT OF ENVIRONMENTAL FLOWS
TOWARDS RIVER HABITAT AND ECOLOGICAL REQUIREMENT WITH A FOCUS ON
DOWNSTREAM FISH SPECIES OF SARDAR SAROVAR DAM (SSD) IN NARMADA RIVER**

Project Duration: 9 months (March-November 2024) (Lean/Pre-monsoon and Post-monsoon)

Project Details:

1.0 Background:

Sardar Sarovar Dam (SSD), a multipurpose Dam is on the mainstream of river Narmada and is about 162 km from the estuarine mouth. This Dam has FRL 138.68 m with a large network of canals. The dam attracts greater ecological concern since the downstream stretch of the Dam has vast fisheries potential which is liable to be impacted owing to prioritized use of stored water upstream, leading to freshwater crunch at downstream. Furthermore, the Kalpasar Department, Government of Gujarat has proposed to construct a barrage across the river Narmada near Bhadbhut village, Gujarat, which is planned at 25 km upstream of the river mouth. Therefore, the downstream of SSD is now restricted to 137km only freshwater. Environmental flows in rivers has been considered as one of the top priorities towards river biodiversity and habitat conservation. In addition, depending on the societal needs the environmental flows becomes more challenging. Looking into the river morphology, few studies on the environmental flows assessment have been made on river Narmada below the SSD. The M.S. University, Vadodara estimated 45 cumecs (1590 cusecs); CWPRS, Pune estimated 30 cumecs (1060 cusecs) and HR Wallingford, London has estimated as 28.30 cumecs (1000 cusecs) of minimum environmental flow to be released d/s to the dam so that salinity ingress is checked, riverine ecology and societal needs are protected. However, these estimates are not directly addressed to the fish species, which is considered as the indicators of river health and biodiversity conservation. During the 41st Environment Sub Group (ESG) meeting held in 2005, Govt. of Gujarat specified that their studies indicate that 600 cusecs would be adequate for maintaining environment flow downstream of SSD. Hence this SubGroup decided that a minimum constant discharge of 600 cusecs of water be maintained downstream of SSD, which is being maintained through Godbole Weir in Dyke No. 3 of Sardar Sarovar Project. These 600 cusecs of water, when supplemented by the water released after generation of power from the River Bed Power House, was found sufficient to maintain the ecology and environment in the downstream reach of Sardar Sarovar Dam. But due to drought/deficient river yield during 2017-2018, River bed Power House could not be operated and this 600cusec water was found insufficient and there have been a number of representations to increase this environment flow quantum. For instance, a petition was also filed before the Hon'ble NGT for enhancing the quantum of e-flow. Hon'ble NGT directed the petitioners to approach Narmada Control Authority, however, instead of doing so, the petitioners had filed a Writ Petition before the Hon'ble Supreme Court. As a result, it was decided to assess the environmental flow, downstream to SSD. On request of SSNNL, ICAR-CIFRI submitted a study report titled "Environmental flows for river ecology with focus on d/s fisheries of SSD in Narmada River" and estimated E-Flow of 1875 cusecs during the lean period (February to May), 14401 cusecs during Monsoon (June to September) and 5753 cusecs during PostMonsoon (October to January) in the stretch between SSD and Garudeswar weir. Furthermore, ICAR-CIFRI also mentioned that due to Garudeshwar weir, the upstream will be a lentic (stagnant) ecosystem in nature. Thus, the E-Flow requirement between d/s of SSD and Garudeshwar weir is not essential as it has already become a pool due to obstruction created by this weir. However, it is highly essential to estimate the E-Flows below Garudeshwar weir and therefore, during 1st and 2nd E-flow Meetings, held on 21st September 2023 and 17th January, 2024, NCA with consent from the all the party states and expert opinions from CWC, IIT Roorkee and NMCG, has decided to re-assess the environmental flow below SSD to Bhadbhut in the river Narmada. With this backdrop, the proposal is planned to work on the following objectives

Sr. No.	Item	Comments
1	<p>2.0 Objectives:</p> <ol style="list-style-type: none"> 1. To assess the seasonal hydrological and hydraulics dynamic in the study area. 2. To assess the seasonal habitat requirement (ecology) of the key stone fish species and major fish diversity 3. To estimate E-flow for fish diversity employing hydraulic rating cum habitat simulation method. 	<p>GoM agrees with Objectives which mentioned in point no 2.0 (1 to 3)</p>
2	<p>3.0 Study area</p>  <p>The study will be carried out between the Garudeswar weir to Bhadbhut stretch in river Narmada (162 km). Total -9 stations (Garudeswar, Poicha, Sisodara, Jhanor, Bharuch, Sakarpura and Bhadbhut and additional one site between Sisodara and Jhanor and one site between Jhanor and Bharuch) will be selected to study on different hydro-biological parameters representing different seasons.</p>	<p>GoM agrees with Study area</p>
3	<p>4.0 Work plan</p> <ol style="list-style-type: none"> 1. River cross sections at the selected sites at different seasons, river discharge, depth and water velocity will be surveyed through ADCP to understand the current hydrological discharge, and river habitat. 2. Seasonal hydrological and biological/ecological parameters assessment and data analysis will be made. 	<p>GoM agrees with Work plan which mentioned in point no 4.0 (1 to7)</p>

Sr. No.	Item	Comments
	<p style="text-align: center;">814</p> <p>3. Focus on identification of key fish species i.e migratory indigenous fish species and studies on their migratory pattern with reproduction.</p> <p>4. Developing fish species specific criteria for e-flows estimation including the depth and velocity requirement.</p> <p>5. Analysis of the 10 daily historical time series of stream-flow in the selected stretches.</p> <p>6. Hydrologic characteristics will be identified for the preliminary E-Flows reaches. Annual hydrographs were constructed, for both naturalized (near-natural) and presentday conditions, through hydrological modelling process, to show changes in flow over the year at a specific location.</p> <p>7. Hydraulic rating cum habitat simulation method (HECRAS model), and the fish biology (e.g., adaptable water depth and velocity for its migration, spawning) will be accessed for e-flows estimation.</p>	
<p>4</p>	<p>4.0 Methodology:</p> <pre> graph TD A[Site visit and field data collection] --> B[Measurements from boat through ADCP and by physical (habitat, depth, velocity, discharge)] B --> C[Experimental fishing, biotic and abiotic samples collection as per the standard protocol] C --> D[Fish species diversity, migratory species and reproduction of this species] D --> E[Habitat preference rating curve for selected fish species] E --> F[Seasonal dynamics of hydrological and ecological parameters] F --> G[Time series hydrological data collection and analysis] G --> H[Survey on the major tributaries of Narmada below SSD and hydrological contribution] H --> I[Assessment of Fish based habitat and Hydraulic rating method(HECRAS)] I --> J[Assessment through Mike 11 hydrological model with fish habitat requirement] J --> K[Integrating fish habitat-based models for E-flows estimation between Garudeswar weir and Bhadbhut] </pre>	<p>GoM agrees with Methodology</p>

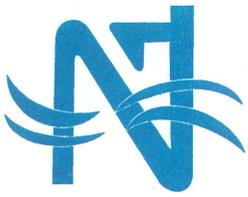
Sr. No.	Item 815						Comments
5	5.0 Activities and Time line						GoM agrees with Activities and Time line
Objectives	Activities	Mar/Apr (Lean)	May/Jun (Pre-monsoon)	Sep/Oct (Post-monsoon)	Nov/Dec		
To investigate on current seasonal dynamics of hydrological, hydraulics and ecological including fish diversity in the selected stretches from downstream of SSD to Bhadbhut.	1.Survey on hydrology, river cross sections						
	2.Fish diversity and reproductive study						
	3.River habitat and ecological assessment						
	4.Collection of secondary data from the respective states Departments/SSNNL						
	5.Seasonal data compilation and analysis for inferring the life stages and migratory period and water requirement						
To estimate the fish habitat based environmental flows requirement in the downstream of the Garudeswar weir to Bhadbhut.	1.Time series hydrological data collection and analysis						
	2.Habitat preference curve for the key fish species						
	3.HECRAS model based simulation considering the selected fish depth						
	4.MIKE11 hydrological model with considering desired fish depth and velocity						
	5.Integrating the fish based models for the environmental flows analysis						
Analysis and Report preparation			First site visit report		Final		

Sr. No.	Item 816			Comments	
6	6.0 Project Cost and Budget			<p>GoM agrees with cost only. if the rates quoted in item no.6.0 A (1 to 6) are on the basis of current schedule of rates of GoI. Otherwise market rate are assumed in Project Proposal, then it will be appropriate to call for quotations and fix the rates at Competent level.</p> <p>According to the opinion of GoM, the Equipments mentioned in item no.6.0 B, should be hired on rental basis as per requirement.</p> <p>According to the opinion of GoM, the overhead cost should be reduced to 10 % instead of 20 % on A+B</p> <p style="text-align: center;">No Comments</p>	
	The costing of project implementation is based on the standard rules and guidelines laid down by ICAR for consultancy services:				
	Sl.No	Particulars	Unit Rate		Total Amount
	A) Recurring Cost				
	1	Cost of Man days of staff deployed			
		Institution Head (Coordinator)	15 days @ Rs. 6000/-		90,000
		Scientist/Senior Scientist	30 days @ Rs. 4000/- x 3 No		3,60,000
		Technical staff	50 man days @ 2000/- x 1 No		1,00,000
					5,50,000
	2	External Payments			
		Young Professional II (1 No)	Rs. 42000 x 9 months		3,78,000
		Young Professional I (1 No)	Rs. 35000 x 9		3,15,000
		Skilled Technical (2 no)	Rs.25,000 x9		4,50,000
					11,43,000
		External payment in terms of hiring Subject based professionals with Bachelor's and Masters degree as YPI and YPII is highly essential for seasonal sample collection, analysis of biological and hydrological data, ADCP operation on field,			
	4	TA & DA			3,50,000
	5	Contingencies (Operational)			3,00,000
		Outsourcing/Data designing			2,00,000
		Vehicle hiring			3,00,000
		Experimental fishing/Fish/Hiring boat (9 sites)			2,20,000
		Consumables (chemicals, glass wares, plastic wares, etc.)			1,00,000
					11,00,000
	6	Intellectual fee (as per ICAR guideline)			5,50,000
					36,93,000
B) Cost of physical inputs/Capital cost					
1	Equipment (Field data recorder/Camera/Biochemical analyser)		7,00,000		
C	Overhead Cost @ 20 % on A + B		8,78,000		
D	GST @ 18% on Consultancy cost		8,22,888		

Sr. No.	Item	Comments
	(A+C) 817	
	Total Cost (A + B + C + D)	60,94,488
7	7.0 Deliverables: Three season E-flow data for survival and propagation of keystone fish species and maintaining downstream ecology along with justifications and modelling for e-flow calculations.	No Comments
8	8.0 Project Team: Project Co-ordinator: Dr.B.K.Das, Director Project Investigator: Dr.A.K.Sahoo, Senior Scientist, ICAR-CIFRI, Barrackpore Project Co-Investigators: Dr. S. Kamble, Senior Scientist, Vadodara ICAR-CIFRI Centre Dr.D.K.Meena, Senior Scientist, ICAR-CIFRI, Barrackpore Dr. Ajoy Saha, Senior Scientist, ICAR-CIFRI, Barrackpore	

OC signed by SE


 (P. G. Patil)
 Dy Superintending Engineer
 Dhule Irrigation Project Circle
 Dhule



No.SSNNL/Env/review/e-flow/ 212

Date: 04/03/2024

To,

**The Executive Member, NCA & Chairman of E-flow Committee
Narmada Sadan, Sector-B, Scheme No. 71-C,
Vijay Nagar, Indore-452010 (M.P.)**

Subject : Proposal on E-flow in the downstream of SSD/Garudeshwar Weir- reg.
Ref : Member (E &R), NCA's letter no. NCA/Env/2023/50 dated 09/02/2024.

Sir,

In continuation of the aforementioned letter from Member (E&R), NCA seeking views/comments on the draft proposal submitted by CIFRI titled "**Assessment of Environmental Flows towards River Habitat and Ecological Requirements with a Focus on Downstream Fish Species of Sardar Sarovar Dam (SSD) in Narmada River.**"

The Government of Gujarat expresses the views/comments of are as follows:

1. The draft Terms of Reference (ToR) provided by CIFRI delineate the study area from the Garudeshwar weir to the Bhadbhut stretch in the Narmada River. Consequently, the downstream segment of the river under consideration for the study, extending from Sardar Sarovar Dam (SSD) to the Bhadbhut Barrage, measures approximately 137 km.

In light of this, the Government of Gujarat (GoG) has recognized the need for a more comprehensive assessment. It is imperative to encompass the entire downstream course of the Narmada River from the SSD to its confluence with the Arabian Sea, totalling approximately 162 km.

2. The inclusion of the following parameters in the draft proposal is paramount to ensuring a comprehensive assessment of the Narmada River ecosystem:
 - I. E-flow w.r.t Salinity Mitigation
 - II. Water Quality
 - III. Ecological Balance
 - IV. Mangrove Conservation
 - V. Cultural needs of people
 - VI. Sustaining Aquatic Flora & Fauna including Fish more particularly with reference to
 - (a) requirement for breeding and migration behaviour of Hilsa Fish and
 - (b) Upstream movement of Mahasheer (Tor tor) during rainy season.

These parameters collectively address various aspects crucial for the preservation and sustainable management of the Narmada River. From maintaining the flow of water to mitigate salinity levels to safeguarding cultural needs and preserving mangrove habitats, each element plays a vital role in ensuring the ecological integrity of the river ecosystem.

Additionally, focusing on sustaining aquatic flora and fauna, especially the breeding and migration behaviours of key fish species like the Hilsa Fish and Mahasheer during critical seasons, further enhances the overall health and resilience of the Narmada River. By incorporating these parameters into the draft proposal, Govt. of Gujarat's objective is to develop comprehensive strategies that effectively tackle the diverse challenges and opportunities associated with the conservation and management of the Narmada River, ensuring its well-being for both present and future scenarios.

(G. Ramana Murthy IFS)

Add. Pri. Chief Conservator of Forests,
SSNNL, Gandhinagar.

Copy Submitted to:

- Hon'ble Managing Director, SSNNL, Gandhinagar.
- Director (Canals), SSNNL, Gandhinagar.
- Director (Civil), SSNNL, Gandhinagar.
- Commissioner of Fisheries, GoG, Gandhinagar.
- Member (E & R), Narmada Sadan, Sector-B, Scheme No. 71-C, Vijay Nagar, Indore-452010 (M.P.) (Email ID : mem.er.nca@nic.in) for kindly take necessary follow-up action.
- Chief General Manager (T & C), SSNNL, Gandhinagar.
- Chief Engineer (D & V), SSNNL, Ekta Nagar.

नर्मदा घाटी विकास प्राधिकरण,
59, अरेरा हिल्स, नर्मदा भवन, भोपाल

दूरभाष नं. 0755-2677504 / 2677591 Email Id - memberforestnvda@gmail.com / dfom21@gmail.com

क./पर्या. एव वन/मा.धि.(मौ.)/Tech-281/2024/129 भोपाल, दिनांक/06-03-2024
प्रति,

Member (Env. & Reh.)
Narmada Control Authority.
Narmada Sadan, Sector-B, Scheme No 74 C,
Vijay Nagar Indore 452010

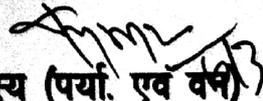
**विषय :- Proposal on E-flow in the downstream of SSD/ Garudeshwar Weir
-reg**

**संदर्भ :-आपका पत्र क्रमांक No. NCA/Env/2023/50, दिनांक 09 फरवरी 2024 एवं पत्र
क्र. No. NCA /Env/2023/69, दिनांक 23 फरवरी 2024**

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उपरोक्त विषयांतर्गत लेख है कि नर्मदा नियंत्रण प्राधिकरण के संदर्भित पत्र से प्राप्त CIFRI द्वारा प्रेषित Draft Project Proposal वस्तुतः सरदार सरोवर परियोजना बांध के Down Stream में Environmental Ecology विशेषतः downstream fish species हेतु Environmental flow की अध्ययन से संबंधित है। यह अध्ययन गुजरात राज्य के Garudeshwar एवं Bhadbut के बीच प्रस्तावित है। अपने-अपने राज्य की सीमा में Environmental flow को निरंतर बनाये रखने एवं तत्संबंधी अध्ययन कराये जाने बाबत निर्णय संबंधित राज्य द्वारा लिया जाना होता है।

अतः उपरोक्तानुसार CIFRI द्वारा प्रेषित उक्त Draft Project Proposal पर मध्यप्रदेश राज्य से अभिमत आवश्यक प्रतीत नहीं होता है। इस संबंध में गुजरात राज्य द्वारा निर्णय लिया जाना उचित होगा।


सदस्य (पर्या. एव वन)
नघाविप्रा भोपाल

821

Office of The Superintending Engineer Narmada Canal Project Circle I Sanchore

No. 3263

Date:- 14/03/2024

-37-

The Chief Engineer
Water Resources
Jodhpur

Sub.:- Downstream Environmental flow in river Narmada from SSD.-reg.
Ref.:- Director (Civil),NCA Indore letter No. NCA/Env/2023/91 dated 14-03-
2024 & CEWR Zone Jodhpur letter No.3716 Date 12-03-2024 and

Sir.

With reference to the above cited subject, SSNNL requested for observations and suggestions on **Central Inland Fisheries Research Institute(CIFRI)'s recommendation** regarding mandatory downstream environmental flow (e-flow) flow in river Narmada from Sardar sarovar Dam.

As CIFRI has submitted its report and recommended quantum of e-flow for Pre-monsoon, Monsoon and Post-Monsoon seasons and SSNNL has requested that the e-flow be enhanced from 600 to 1500 cusecs till a detailed exercise is undertaken to review the quantum of e-flow and arrive at a more realistic value.

In this regard Comments of Superintending Engineer,Narmada Canal Project Circle I Sanchore are as under.

"This office is unable to agree suggestions on (CIFRI)'s recommendation regarding mandatory downstream environmental flow (e-flow) in river Narmada from Sardar sarovar Dam Because **share of Rajasthan state will be reduced up to 20%.**"

AS per CIFRI's recommendations it is found from calculation that 118 cusecs water will be reduced from the share of Rajasthan which is near about 20% of Rajasthan state's share. Also Considering water allowance @2.70/1000 acre, It will reduce 43700 acre(17690ha) Culturable Command Area of Narmada Canal Area, of Rajasthan, Which is not affordable for Rajasthan being a desert state Since command area of Narmada Canal Project in Rajasthan Located in Desert Area Almost 30% quantum of water is Being utilised for Drinking Propose hence there is necessity to not reduce Rajasthan share.

Even a minimum volume of water is also needed to fulfill minimum requirements for natural habit at Ecology aspect in Rajasthan state portion.

So,it is requested that Rajasthan state's share should not be reduced regarding downstream environmental flow(e-flow) in river Narmada from Sardar sarovar Dam.

Your's sincerely


Superintending Engineer
Narmada Canal Project
Circle I, Sanchore

14/3/24

कार्यालय अधीक्षण अभियंता नर्मदा नहर परियोजना वृत प्रथम सांचौर

क्रमांक: 3302

दिनांक: 18/03/2024

Member (Env. & Reh.)
Narmada Control Authority.
Narmada Sadan, Sector-B, Scheme No 74 C,
Vijay Nagar Indore 452010

विषय:- Proposal on E-flow in the downstream of SSD/Garudeshwar Weir

संदर्भ:- आपका पत्र क्रमांक No. NCA/Env/2023/50, दिनांक 09 फरवरी 2024 एवं पत्र क्र. No. NCA/Env/2023/69, दिनांक 23 फरवरी 2024

उपरोक्त विषयान्तर्गत लेख है कि नर्मदा नियंत्रण प्राधिकरण के संदर्भित पत्र से प्राप्त CIFRI द्वारा प्रेषित Draft Project Proposal वस्तुतः सरदार सरोवर परियोजना बांध के Down Stream में Environmental Ecology विशेषतः downstream fish species हेतु Environmental flow की अध्ययन से सम्बंधित है।

अतः CIFRI की उपरोक्त रिपोर्ट पर राजस्थान के Comments निम्न प्रकार से है :-

1. राजस्थान राज्य के हिस्से के पानी की कटौती किये बिना तथा राजस्थान राज्य के हिस्से की लागत में किसी भी प्रकार की वृद्धि किये बिना राजस्थान राज्य CIFRI की उक्त रिपोर्ट से सहमत है।
2. सरदार सरोवर बांध के downstream में मानसून के दौरान होने वाले overflow पानी को उचित रूप से सहेजकर यथा Storage Dam बनाकर अथवा अन्य स्रोतों में इकठ्ठा कर जरूरत के समय आवश्यकतानुसार उस पानी को E-Flow के रूप में गुजरात राज्य द्वारा उपयोग में लिया जा सकता है।
3. चूँकि उक्त E-flow का प्रस्तावित क्षेत्र सरदार सरोवर बांध के Downstream में गुजरात राज्य में प्रवाहित नर्मदा नदी में है, अतः इस सम्बन्ध में गुजरात राज्य द्वारा निर्णय लिया जाना उचित होगा।
4. विशेष परिस्थितियों में यदि overflow पानी Dam में नहीं होता है तो उस वर्ष अन्य सम्बंधित राज्यों से सुझाव लिया जाना उचित होगा।


अधीक्षण अभियंता
नर्मदा नहर परियोजना
वृत प्रथम, सांचौर

क्रमांक: 3303-04

दिनांक: 18/03/2024

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रस्तुत है :-

1. श्रीमान मुख्य अभियंता जल संसाधन विभाग राजस्थान, जयपुर।
2. श्रीमान मुख्य अभियंता जल संसाधन संभाग जोधपुर।


अधीक्षण अभियंता
नर्मदा नहर परियोजना
वृत प्रथम, सांचौर



सत्यमेवजयते
Government of
Maharashtra
Water Resource
Department



823



Execuive Engineer,
Narmada Development Division,
Nandurbar. 425412.
Teli./Fax No. 02564-222291
email id :-ee_narmada@yahoo.co.in

No./NDDN/PB-1/587/2024**Date :-30/ 04/2024**

To,

**The Superintending Engineer,
Dhule Irrigation Project Circle,
Dhule.**

Subject :- Comments on Minutes of 3rd meeting of E-flow committee-reg.

Reference:- Narmada Control Authority, Indore's Letter No.NCA/Env/2023/125
Date:-16/04/2024.

With reference to letter and Subject cited above, Comments on Minutes of 3rd meeting of E-flow committee are submitted herewith for your kind information and further needful please.

DA :-As Above


(S.D. Khairnar)
Executive Engineer
Narmada development Division
Nandurbar

Copy Respectfully Submitted to Hon.Member (Env. & Reh.) Narmada Control Authority, Indore for information and necessary action please.

D.A:- As Above.

COMMENTS ON MINUTES OF THE 3rd MEETING OF THE COMMITTEE TO REVIEW THE ENVIRONMENTAL FLOW OF RIVER NARMADA DOWNSTREAM OF SARDAR SAROVAR PROJECT (SSP), HELD ON 19 TH MARCH, 2024 AT 11.00 HRS THROUGH VIRTUAL PLATFORM

1. INTRODUCTION:-

The 3rd Meeting of the Committee, to review the Environmental Flow (E-Flow) of river Narmada downstream (d/s) of SSP, was held on 19th March, 2024 through virtual platform, under the Chairmanship of Shri Ashok Kumar Thakur, Executive Member, NCA. The focus of the meeting was to finalize the Scope of work/Terms of Reference (ToR) of CIFRI, with respect to the re-assessment study of E-Flow in order to protect the downstream riverine environment of river Narmada and Award of study to CIFRI through SSNNL, GoG. List of Officers participated in the meeting is enclosed at Annex-I.

At the outset, Executive Member, NCA and Chairman of the Committee welcomed all the participants. Chairman, in his introductory remark stated that during the first meeting of the Committee, held on 21st September, 2023 in Indore, decision was taken for re-assessment of seasonal E-flow to be carried out by GoG through CIFRI, by considering various parameters while in the 2nd Meeting it was decided that CIFRI would prepare Scope of work/ToR, along with names of partner institutions and financial implications for the re-assessment study of Eflow and submit to NCA.

He further stated that the Scope of work/ ToR received from CIFRI was circulated to the Committee Members (Annex-II) to obtain the technical views/comments till 07.03.2024. Technical views/ comments received from GoM (Annex-III), GoG (Annex-IV), GoMP (AnnexV) & GoR (Annex-VI) vide letters dated 15.02.2024, 04.03.2024, 06.03.2024, 14.03.2024 and 18.03.2024 respectively were circulated among Committee Members.

Further, EM, NCA and Chairman of the Committee reiterated that as per the decision taken during the 94th NCA meeting, and consecutive meetings of the E-flow, the present forum is solely responsible for the process of award of the study to CIFRI and recommending the E-flow quantum. Decision w.r.t. sharing of this revised E-flow Quantum shall be taken at higher level, i.e., in NCA / RCNCA Meetings with the consensus of all the party States.

Chairman of the Committee further stated that the Counsel of NCA, who is defending on behalf of NCA & MoJS, DoWR, RD & GR has conveyed that the Judges of Hon'ble Supreme Court expressed their displeasure against the function of NCA, because the Quantum of E-flow is yet to be decided.

Executive Member, NCA and Chairman of the Committee then requested Member (E&R), NCA to take up the agenda for further deliberation.

Member (E&R), NCA, before taking up the Agenda items for deliberation, clarified to the States that this E-flow Committee is constituted only to assess the quantum of E-Flow and submit its recommendations to the Authority. The study is only to re-assess the quantum of EFlow to be released from the d/s of SSP/ Garudeshwar Weir. The decision for releasing of EFlow quantum and water sharing will be taken in the appropriate level, may be in the NCA or RCNCA or during the review of the Award. Arbitrarily, NCA cannot allocate any water without the same getting addressed in the appropriate forum and getting proper consensus from the party States.

Member (E&R), NCA then requested Dr. B.K. Das, Director, CIFRI to share the presentation on the Scope of work/ToR of CIFRI, with respect to the proposal on "Assessment of Environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of SSD in Narmada River" and their response to the technical comments/views received from the Committee.

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Item No.	Item	Comments
2.	Central Inland Fisheries Research Institute(CIFRI)	
	<p>Dr. B.K. Das, Director</p> <p>Dr. B.K. Das before giving his presentation clarified that CIFRI is a scientific and Government organization and the proposed Scope of work for E-flow assessment is based on the ICAR guidelines on Contract/ Consultancy Project. Further, Dr. Das presented the proposal of Scope of work/ToR and the Budget estimate (Annex-II) with proposed objectives, study area, methodology, timeline and highlighted the suggestions provided by the party States in details. He intimated that the proposed study has 3 objectives, which are as follows:-</p> <ol style="list-style-type: none"> 1. To assess the seasonal hydrological and hydraulics dynamic in the study area. 2. To assess the seasonal habitat requirement (ecology) of the key stone fish species and major fish diversity. 3. To estimate E-flow for fish diversity employing hydraulic rating cum habitat simulation <p>Briefing on the proposed study area, Dr. Das intimated that study will be carried out between Garudeshwar weir to Bhadbhut Barrage which is about 125 km freshwater zone having 9 stations, viz.Garudeshwar, Poicha, Sisodara, Jhanor, Bharuch, Sakkarpara, Bhadbhut, one site between Sisodara & Jhanor and one site between Jhanor & Bharuch, to study on different hydrobiological parameters representing different seasons.</p> <p>With respect to the proposed Methodology, Director, CIFRI intimated that the field data will be collected by performing field visits, assessment w.r.t. habitat, depth, velocity and discharge will be carried out from boat both manually as well as employing Acoustic Doppler Current Profiler (ADCP). Further, there will be an Experimental fishing, biotic and abiotic sample collection as per the standard operating protocol. The proposed methodology comprehensively includes study of Fish species diversity, migratory species and their reproduction cycle, preparing Habitat preference rating curve for identified fish species, Seasonal dynamics of hydrological and ecological parameters, collection of time series hydrological data and its interpretations.</p> <p>Moreover, the proposed study also involves survey on the major tributaries of Narmada below SSD and its hydrological contribution, Assessment of Fish based habitat using Hydraulic rating cum habitat simulation method (HECRAS), Assessment through Mike 11 hydrological model with fish habitat requirement, integrating fish habitat-based models for E-flow estimation.</p> <p>Further, Dr. Das gave point wise reply to the observation of the party States:-</p>	

Sl. No.	Comments from States	826 Replies of CIFRI
1.	<p><u>Govt. of Rajasthan (Annex-VI)</u> This office is unable to agree suggestions on (CIFRI)'s recommendation regarding mandatory d/s environmental flow (E-flow) in river Narmada from SSD Because share of Rajasthan state will be reduced up to 20%.</p>	<ul style="list-style-type: none"> • The comments are not related with the proposed study on “Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of SSD in Narmada River”
2.	<p><u>Govt. of Madhya Pradesh (Annex-V)</u> <u>अतः उपरोक्तानुसार CIFRI द्वारा प्रेषित उक्त Draft Project Proposal पर मध्यप्रदेश राज्य से अभिमत आवश्यक प्रतीत नहीं होता है। इस संबंध में गुजरात राज्य द्वारा निर्णय लिया जाना उचित होगा।</u></p>	<ul style="list-style-type: none"> • Matters doesn't pertain to the Scope of Work
3.	<p><u>Govt. of Maharashtra (Annex-III)</u></p> <ol style="list-style-type: none"> 1. GoM agrees with cost only. If the rates quoted in item no.6.0 A (1 to 6) are on the basis of current schedule of rates of GoI. Otherwise market rate are assumed in Project Proposal, then it will be appropriate to call for quotations and fix the rates at competent level. 2. According to the opinion of GoM, the Equipments mentioned in item no.6.0 B, should be hired on rental basis as per requirement. 3. According to the opinion of GoM, the overhead cost should be reduced to 10% instead of 20 % on A+B 	<ul style="list-style-type: none"> • Item no. 6.0 A (1-6) has been prepared as per the ICAR guidelines on Contract/ Consultancy Project • Equipment, such as, Biochemical Analyser is not available on rental basis as this is purely laboratory use only. Furthermore, the cost of hiring of Camera and Data Recorder will be almost same as the cost of the equipment. • As per the ICAR guidelines, the overhead cost has been fixed to 20 %.

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Sl. No.	Comments from States	Replies of CIFRI
4.	<p>Govt. of Gujarat (Annex-IV)</p> <p>1. The draft ToR provided by CIFRI delineate the study area from the Garudeshwar weir to the Bhadbhut stretch in the Narmada River. Consequently, the d/s segment of the river under consideration for the study, extending from SSD to Bhadbhut Barrage, measures approximately 137 km.</p> <p>In light of this, GoG has recognized the need for a more comprehensive assessment. It is imperative to encompass the entire d/s course of River Narmada from the SSD to its confluence with the Arabian Sea, totaling approximately 162 km.</p> <p>2. The inclusion of the following parameters in the draft proposal is paramount to ensure a comprehensive assessment of the Narmada River ecosystem.</p> <p>I. E-Flow w.r.t. Salinity Mitigation II. Water Quality III. Ecological Balance IV. Mangrove Conservation V. Cultural Needs of People VI. Sustaining Aquatic Flora & Fauna including Fish more particularly w.r.t.</p> <p>a) Requirement for breeding and migration behavior of Hilsa Fish and b) Upstream movement of Mahaseer (<i>Tor tor</i>) during rainy season</p> <p>Additionally, focusing on sustaining aquatic flora & fauna, especially the breeding and migration behavior of key fish species like the Hilsa Fish and Mahaseer during critical season, further enhances the overall health and resilience of the Narmada River.</p>	<ul style="list-style-type: none"> • As per the 1st and 2nd Meeting of the Committee held on 21st September, 2023 & 17th January, 2024, it was discussed and finalized that the d/s of SSD is extremely critical for E-Flows estimation as different agencies have estimated different figures of discharge/release as well as by adopting different methodologies without considering the biodiversity and river habitat ecology. Therefore, the Committee agreed to estimate the E-Flows only for river ecology and Fisheries within the stipulated period of time (9 months). • Furthermore, it was also highlighted that GoG has planned and started developing the Bhadbhut Barrage which would be completed within a few years. Therefore, the river stretch above the Barrage needs to be estimated for protecting the Freshwater ecology, fisheries and biodiversity. The d/s of the Barrage will be entirely different ecosystem i.e. estuarine ecosystem. Water requirement for salinity mitigation and mangrove require a detailed investigation prior to the estimation of E-Flow. Therefore, the methodology will be significantly different from upstream study and would require a multi-disciplinary team with in depth study which is time consuming. • Therefore, combining the proposed study with this would not solve the objectives as discussed in the two Meetings. • As it has been explained, water requirement and habitat <i>Tor tor</i> and Hilsa are different. Studies to establish their breeding ground and migration required detailed investigations through different approaches.

Sl. No.	Comments from States	828 Replies of CIFRI	
		Therefore, focus on the proposed study would serve the objectives of the main discussion that the Committee did in the meeting. However, social cultural and other requirement for estimation of E-Flow could be taken up separately towards sustainable Narmada ecosystem.	
	After detailed presentation of Director, CIFRI, Member (E&R), NCA requested the party States to give their comments/views on these issues.		
3.	Views of party States:-		
	a) Govt. of Gujarat:- Shri. Ramana Murthy, APCCF stated that views of GoG has already been submitted vide letter No. SSNNL/Env./review/e-flow/21 dated 04.03.2024. Further, Shri K. A. Keshvani, CGM (T&C), SSNNL stated that sometimes back GoG has requested to carry out the study from d/s of SSP to Gulf of Cambay. Again he requested the Committee to carry out the study up to Gulf of Cambay instead of up to Bhadbhut Barrage.		This issue pertaining with GoG.
	b) Govt. of Madhya Pradesh:- Shri. John Kingsely, Director (Reh.), NVDA intimated that the length of the River Narmada is 1312 km before draining in to Gulf of Cambay. In the first 1,077 km reach, the river flows in Madhya Pradesh, the next 35 km stretch of river forms the boundary between the States of MP and Maharashtra and the next 39 km, it forms the boundary between Maharashtra and Gujarat. The last stretch of 161 km lies in Gujarat. Proposal for carrying out the studies only in the part of Gujarat for about 161 km d/s of SSP before draining in to Gulf of Cambay will not serve the purpose. Hence, it is suggested that to safeguard the riverine ecology, the study should be carried out for the entire stretch of river Narmada so that the water required for every stage from Amarkantak till the draining in to Gulf of Cambay can be known instead of carrying out the studies for d/s of SSP. On the other hand, if the concerned States wanted to carry out the studies in their territory, they can do the study without affecting the NWDT Award. If, NCA wanted to carry out the study, in that case, the study should be carried out for the entire Narmada Basin rather than carrying out only in Gujarat territory.		This issue pertaining with GoMP.
	c) Govt. of Maharashtra:- Shri. S.S Khandekar, SE, Water Resource Department, Dhule stated that if the E-flow is to be calculated and to be released for the whole stretch of Narmada basin, the views of GoMP is correct. However, if the study is to be carried out only for the d/s of SSP, then the final decision on this issues needs approval of higher/Competent Authority, GoM. In this regard, Member (E&R), NCA again emphasized that the Committee is constituted only		As a representative of GoM, S.E, DIPC, Dhule has stated the opinion regarding the study on the proposal submitted by CIFRI which included in the minutes.

	<p>to assess the quantum of E-Flow with the help of Expert Members & Institution and submit the same to the Authority. The study is only to re-assess the quantum of E-Flow to be released from the d/s of SSP.</p> <p>She then requested GoM to give technical views on the proposal submitted by CIFRI. SE, GoM stated that the study to be restricted upto Bhadbhut Barrage only from Garudeshwar Weir. Mitigation of d/s salinity should be addressed by the Bhadbhut Barrage project and water from SSD should not be used for the same.</p>	<p>However, S.E, DIPC, Dhule has agree with the study of E-flow upto Bhadbhut Barrage only from Garudeshwar weir and not for Downstream of Bhadbhut Barrage.</p> <p>S.E, DIPC, Dhule, also clearly stated that, for mitigation of D/S salinity, the required water should be used from Bhdbhut barrage only and not from Sardar Sarovar Dam.</p>
	<p>d) Govt. of Rajasthan:-</p> <p>Shri Shreepal Meena, SE, NCP, Sanchore welcomed the study for the e-flow up to Bhadbhut barrage but also indicated that Rajasthan being an arid State, the economy of the three districts Barmer, Jalore and Sanchore (earlier Sanchore was town and now became/declared as district) is totally dependent on this 0.5 MAF of Narmada water. So, he urged that any decision on upward revision should not affect the share of Rajasthan. Further he suggested that GoG may make a provision to store more water during the rainy season/filling period which can be utilized as E-flow rather than relying only from the share of utilizable flow.</p>	<p>This issue pertaining with GoR.</p>
	<p>After obtaining the views of party States, Member (E&R), NCA requested the Expert Members to give their comments/views on these issues.</p>	
<p>4.</p>	<p>Views of Expert Members:-</p>	
	<p>Central Water Commission (CWC)</p> <p>a) Shri N.N.Rai, Director (Hydrology)</p> <p>Shri. N.N.Rai stated that for E-flow assessment for the ecological needs i.e., Fish diversity as decided in the 2nd Meeting of the E-flow Committee, the d/s of SSP up to Bhadbhut Barrage should be carried out instead of going for the whole basin which will take more time. But for the salinity mitigation, mangrove conservation and cultural needs of people the requirement of E-Flow will be entirely different. He further stated that the methodology for assessment of E-flow is still not standardized in the estuarine ecosystem; hence the extended study area in accordance to GoG is not feasible at present moment. He further added that for 7 assessment of the E-flow HECRAS method is a most appropriate method which can be employed in the present study.</p> <p>IIT, Roorkee</p> <p>b) Prof. Dr. Arun Kumar</p> <p>Dr. Arun Kumar endorsed the views of Director (Hydrology), CWC. After going through the comments received from different States, he stated that E-flow in the river is a necessity which has not been calculated so far for Narmada Basin. Therefore, E- flow should be calculated for the entire Narmada basin.</p>	<p>This issue not pertaining with GoM.</p> <p>This issue not pertaining with GoM.</p>

Dr. Arun Kumar stated that the study be conducted till Bhadbhut Barrage in the first phase and may be extended later to the Sea in the second phase. He also urged to carry out the study as soon as possible because if the Hon'ble NGT issues an order, it might fix a higher quantum of E-flow which will surely affect the water sharing of all party States.

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c) Shri Anup Shrivastava, Executive Director (Technical)

Shri. Anup Shrivastava stated that there is a general agreement for carrying out the studies for the d/s of SSP up to the River draining in to the Gulf of Cambay. He suggested for carrying out the study in entire d/s from SSD till the confluence of river but in phased manner. In the first phase the study should be This issue pertaining with GoM. from Garudeshwar weir to Bhadbhut barrage and in the next phase from Bhadbhut barrage to till the confluence of river in to Gulf of Cambay i.e., the mouth of the River. The upstream study of E-Flow can be carried out from the beginning of river Narmada in another phase.

He further stated that in the present study HECRAS and Mike 11 hydrological Model have been proposed which are one dimensional study method. He suggested carrying out the proposed study employing the HECRAS method so as to avoid confusion with two sets of values.

After detailed discussion Executive Member, NCA and Chairman of the Committee thanked everyone for their views and deliberation on these important issues. Further, he stated that NCA is established for the purpose of securing compliance with and implementation of the decision and directions of the Narmada Water Dispute Tribunal Award. The Committee is taking up the reassessment work as per the decisions of 94th NCA meeting. Views of the NCA comprises of all the States and NCA takes any decision with the consensus of the party States. The proposed study will be carried out by the SSNNL, GoG through CIFRI as decided in the first and second Meeting of E-flow Committee for the d/s of SSP. He further stressed that by this time the study would have been awarded which is still pending. 8

Moreover, as per the direction of Hon'ble NGT, all States have to maintain a minimum E-Flow in their rivers to protect the riverine ecology and meet the societal needs. The intervening structures on river Narmada cannot be exempted from the regime of E-Flow. Therefore, it is the responsibility of every States to maintain the E- Flow in their territory. GoMP has also to ensure that minimum prescribed E-Flow gets released from their diversion structures erected on River Narmada.

Further, during the second meeting when Member (E&R), NCA, had enquired about the amount of water being released by GoMP in their territory from various dams, like, Bargi, Tawa, ISP, etc., Member(Power), NVDA intimated that these data are available with CWC, Bhopal and the same can be obtained from them.

Even though, if all the States agreed to carry out the study for the whole basin and the expert Members also suggest for the same, it is acceptable to the Committee. But at the same time, it is a lengthy process and to complete the study for the whole basin more time is required. But the present case is already in the Hon'ble NGT to release the downstream E-Flow from SSD. If the issue is not settled at the right time, as informed by the Expert Members, Hon'ble NGT may issue a direction to

This issue not pertaining with GoM.

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release the E-flow which may be on the higher side. Then every States will have to follow the direction of Hon'ble NGT and accordingly each States has to release the water to safeguard the riverine ecology of the River Narmada.

Keeping in view, if all the States agree for reassessment of E-flow for the downstream of SSP, the same will be awarded to CIFRI .Else, if the studies are required for whole basin or till the sea, then the issue will be put up in NCA meeting and as per the directions of the Authority further action can be taken. He then requested the party States to give their final views on this issue for taking decision.

Member (E&R), NCA stated that as discussed in the earlier Meeting in the first phase the study would be given for the d/s of SSP. For the upstream of SSP, as decided in the first meeting GoMP will take up the study in their territory separately.

Further Member (E&R), NCA enquired from CIFRI that if the study is extended for another 25 km from Bhadbhut barrage to the mouth of the river whether the study period will increase, methodology will change and the estimate will increase.

In response to above, Dr. Amiya Sahoo, Senior Scientist, CIFRI stated that as per decision taken in first and second Meeting of the E-Flow Committee, the study area is restricted from Garudeshwar weir to Bhadbhut Barrage. The entire 20-25 km areas d/s to Barrage is an estuarine zone with wider mouth, which has different cross section and hydraulic parameters.

Dr. Amiya Sahoo emphasized that keeping in view the technical and scientific constraints, currently the study can be initiated up to Bhadbhut Barrage in the first phase.

Shri N.N. Rai, Director (Hydrology), CWC agreed with the views of Dr. Amiya Sahoo. He stated that the estuarine ecosystem is entirely different. Therefore, in the initial phase, the study may be considered up to Bhadbhut Barrage. As Bhadbhut barrage is under construction, study will be required up to the Barrage. At this stage the study area of estuarine ecosystem should not be considered along with fresh water ecosystem. Referring the issues being faced while computing the E-Flow for estuarine ecosystem of Mahanadi, Director, CWC suggested to go for the fresh water ecosystem i.e. up to Bhadbhut barrage.

Dr. Arun Kumar, Professor, IIT Roorkee also endorsed the views of Shri N.N. Rai, suggesting to get the proposed study done up to Bhadbhut Barrage initially and then from Bhadbhut Barrage to mouth of the river in the next phase.

Shri Kanungo, CE (Dam & Vadodara), SSP in reference to the Member (E&R)'s enquiry on the status on construction of Bhadbhut barrage stated that about 40% of works has been completed. Then Member (E&R) informed that since the construction of Bhadbhut barrage as already started in 2020 and going to be completed by 2026, the present E-flow study from Garudeshwar Weir be confined upto Bhadbhut barrage only, which is a practice in cascade projects.

Shri Ramana Murthy, APCCF, GoG intervened and stated that MD, SSNNL in the recent past convened an internal meeting along with the officers from Kalpasar Department, wherein it was decided that an integrated study should be carried out for the entire stretch d/s rather than up to Bhadbhut Barrage for comprehensive assessment to effectively mitigate salinity levels, address the

	<p>cultural needs of people and to preserve mangrove habitats. 832</p> <p>He further stated that in 2012, it was also decided that whatever the quantum of E- flow is released from SSP, the same quantum will be released from Bhadbhut Barrage up to mouth of the river. Therefore, the study should be considered for comprehensive assessment of E-Flow up to mouth of the river with reasonably compromising some of the study parameters.</p> <p>During discussion Shri Ramana Murthy, APCCF, GoG enquired whether the E-flow is/not required for the d/s of Bhadbhut Barrage. And if required, the stretch below the Bhadbhut barrage can be considered for computing E-flow to some extent by compromising some parameters.</p>	
5.	<p><u>Decision taken.</u></p> <p>In view of the above, Member (E&R) NCA suggested that in first phase the study may be assigned to CIFRI up to Bhadbhut Barrage as CIFRI has already submitted the proposal for the first phase. In the second phase the extended area below the Bhadbhut may be considered. In this regard, Shri.Ramana Murthy, APCCF informed that approval of Competent Authority is required for assigning the work for the first phase, i.e., up to Bhadbhut Barrage.</p> <p>Shri SS Khandekar, SE,WRD, GoM stated that opinion of other party States is also required for carrying out the studies as suggested by Member (E&R) as above. He further stated that as informed by the Expert Members the area under consideration for E-flow study has two ecosystem, different catchment and hydrological parameters. The E- flow requirement below the Bhadbhut Barrage will be met out from the water stored in Bhadbhut Barrage.</p> <p>Therefore, as suggested by Expert Members in the first phase the study can be considered from Garudeshwar weir to Bhadbhut barrage as proposed by CIFRI, the second phase from Bhadbhut till the Gulf of Cambay can be considered later as this would involve more complicated study, involving an array of parameters to address wide river mouth and its estuarine zone.</p> <p>After the views and comments of the Members of the Committee, in order to converge on the issue, EM, NCA and Chairman of the Committee called for the final views from the party States. GoM and GoR agreed to the proposal of the study up to Bhadbhut barrage while GoG suggested to extend the study area up to mouth of the river. However, GoMP representative did not comment on this.</p> <p>As there was no consensus among the party States, EM, NCA & Chairman of the Committee desired that the issues will be put up for the directions of the Authority in the next NCA Meeting.</p>	<p>S.E, DIPC, Dhule has stated the opinion regarding E-folw which included in minutes.</p> <p>S.E, DIPC, Dhule agrees with the proposal of the study upto Bhadbhut Barrage only.</p> <p>However, Hon. Chairmen of Committee has desired the issues regarding E-flow will be put up for direction of Authority in the next meeting of NCA. Hence no comments.</p>

Meeting ended with a vote of thanks to the chair.


(S.D.Khairnar)

Executive Engineer
Narmada development Division
Nandurbar