

No. CWC/UGBO/EF/SR 1



**MoWR, RD&GR
Central Water Commission
Upper Ganga Basin Organization**

**IMPLEMENTATION OF MINIMUM ENVIREMENTAL FLOWS IN
RIVER GANGA (Up to UNNAO)**



STATUS REPORT

April, 2019

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1.0 BACKGROUND

Ecological needs of the river have been recognized as one of the uses of water in the National Water Policy (2012). In the Preamble of the policy, it is mentioned that *‘water is essential for sustenance of eco-system, and therefore, minimum ecological needs should be given due consideration’*. Clause 3.3 specifies that *“A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water uses”*.

Vide Gazette Notification dated 9th October, 2018, the Government of India has notified the minimum environmental flows for River Ganga that has to be maintained at various locations on the river. Environmental flows are the acceptable flow regimes that are required to maintain a river in the desired environmental state or predetermined state. The maintenance of minimum e-flow in the river would not only ensure sustenance of aquatic life but also go a long way in ensuring its *Aviralta* or continuous flow in the river. It will ensure that the river has at least the minimum required environmental flow of water even after the river flow gets diverted by projects and structures for purposes like irrigation, hydropower, domestic and industrial use etc.

The above order will apply to the upper Ganga River Basin starting from originating glaciers and through respective confluences of its head tributaries finally meeting at Devaprayag up to Haridwar and the main stem of River Ganga up to Unnao district of Uttar Pradesh. The compliance of minimum environmental flow is applicable to all existing, under-construction and future projects. The existing projects which currently do not meet the norms will have to ensure that the desired environmental flow norms are complied with within a period of three years. The mini and micro projects which do not alter the flow characteristics of the river or stream significantly are exempted from these environmental flows.

The flow conditions in these river reaches shall be monitored at hourly intervals from time to time. The Central Water Commission has been entrusted the responsibility for supervision, monitoring, regulation of flows and reporting of necessary information to the appropriate authority as and when required and also take emergent decisions about the water storage norms in case of any emergency.

The concerned project developers or authorities will have to install automatic data acquisition and data transmission facilities at appropriate locations at project sites within six months. The Central Government through National Mission for Clean Ganga may direct release of additional water in the River Ganga to meet special demand as and when required.

2.0 GANGA PHYSIOGRAPHY

The Ganga river basin is the largest river basin in India in terms of catchment area, constituting 26% of the country's land mass (861,404 sq. km) and supporting about half a billion population. The drainage area of the basin lies in 9 states covering Uttarakhand, Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, West Bengal, Haryana, Himachal Pradesh and the Union Territory of Delhi. It traverses a course of 2525 km before flowing into the Bay of Bengal. It has a large number of tributaries joining it during this journey. The main physical sub-divisions are the Northern Mountains, the Gangetic Plains and the Central Highlands. Northern Mountains comprises the Himalayan ranges including their foot hills. The Gangetic plains, situated between the Himalayas and the Deccan plateau and covering most of the basin, are ideally suited for intensive cultivation. The culturable area of Ganga basin is about 57.96 M. ha which is 29.5% of the total culturable area of the country.

In the monitoring reach of river Ganga upto Unnao, there are many manmade interventions utilising the water for various developmental needs such as drinking water, irrigation, hydro power etc. These projects impact the natural flows in the river. In upper Ganga basin upto Hardwar, there are a number hydro-electric projects. The most of the projects are run-of-the river (ROR) projects with Tehri being a major storage project having gross storage of 3.54 BCM, live storage 2.615 BCM, At Haridwar, Ganga opens to the Gangetic Plains, where Bhimgoda barrage diverts a large quantity of its waters into the Upper Ganga Canal, to provide water for irrigation and other consumptive uses. Further, about 76 km downstream of Haridwar, at Bijnore, another barrage diverts water into the Madhya Ganga Canal but only during monsoon months. At Narora, there is further diversion of water into the Lower Ganga Canal from Narora barrage. Narora barrage is about 155 km downstream of Bijnor barrage. From the barrage at Kanpur, Ganga water is being diverted to meet the drinking water requirements.

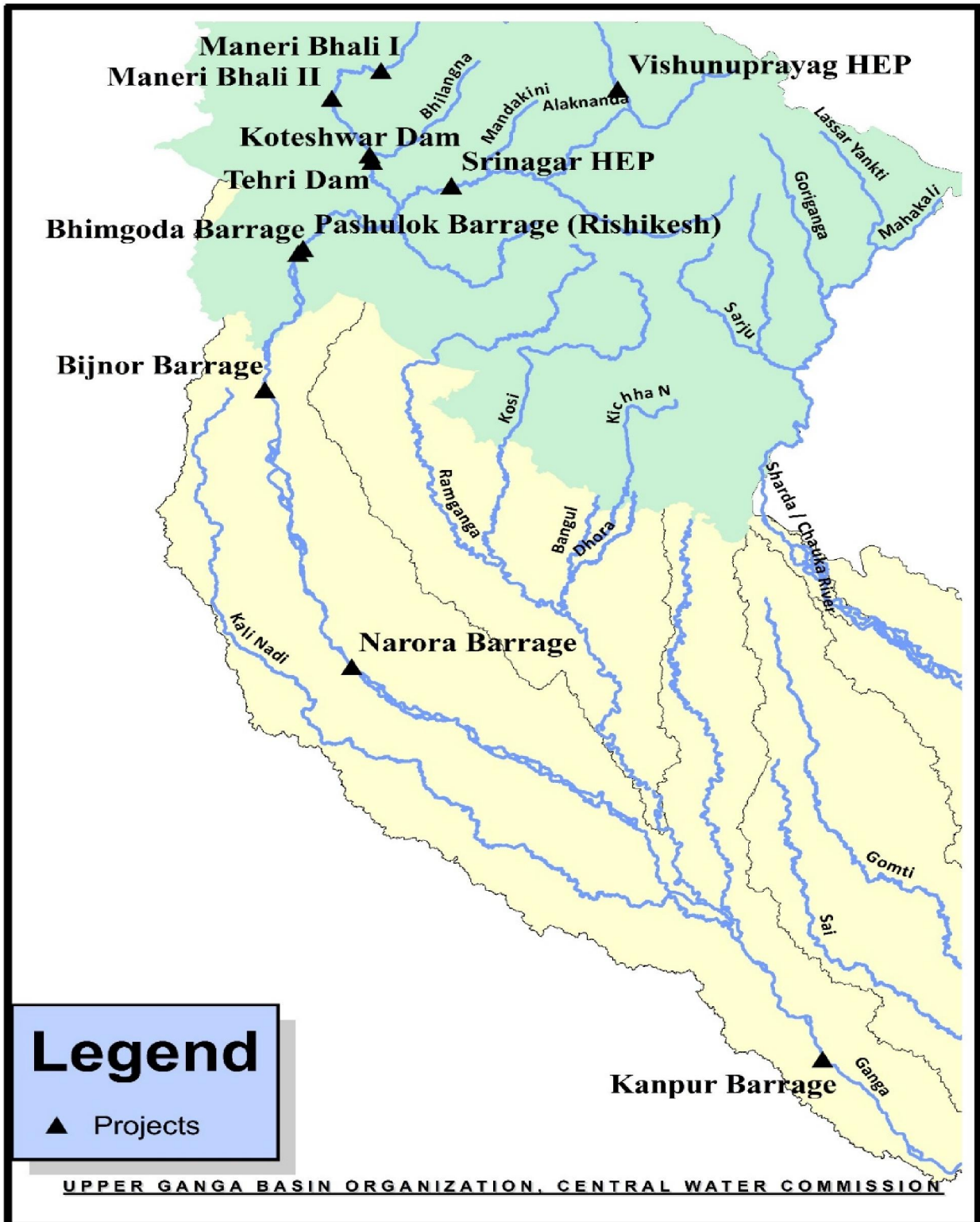


Figure 1: Map showing key projects under jurisdiction of UGBO.

3.0 MINIMUM E-FLOWS NORMS

The e-flows notified by the Government of India are as follows:

3.1 Upper Ganga River Basin Stretch starting from originating glaciers and through respective confluences finally meeting at Devaprayag up to Haridwar:

SI No	Season	Months	(%) Percentage of Monthly Average Flow observed during each of preceding 10-daily period
1	Dry	November to March	20
2	Lean	October, April and May	25
3	High Flow	June to September	30*#

*# 30% of monthly flow of High flow season.

Table 1: Minimum e-flows from originating glaciers up to Haridwar.

3.2 Stretch of main stem of River Ganga from Haridwar, Uttarakhand to Unnao, Uttar Pradesh

SI No	Location of Barrage	Minimum flow releases immediately downstream of barrages (In Cumecs) Non-Monsoon (October to May)	Minimum flow releases immediately downstream of barrages (In Cumecs) Monsoon (June to September)
1	Bhimgoda (Haridwar)	36	57
2	Bijnor	24	48
3	Narora	24	48
4	Kanpur	24	48

Table 2: Minimum e-flows from Haridwar to Unnao.

The copy of the **Gazette Notification** dated 9th October, 2018 is enclosed at **Annex-I**

4.0 PROJECTS UNDER MONITORING

In upper Ganga river basin up to Hardwar, river valley projects are largely non-consumptive and are mainly used for hydro power generation. Few minor projects are also being used for irrigation and drinking water purposes. The list of existing ongoing and contemplated projects is enclosed at **Annex-II**. From Hardwar onwards beginning with Bhimgoda Barrage, projects are being used for water diversion for irrigation and domestic uses.

The key projects in Ganga upto Unnao are listed below:

SN	Name of Project	River/Tributary	Place/State	Status
Projects on Alaknanda and its tributaries				
1.	Vishnuprayag HEP (400 MW)	Alaknanda	Joshimath/Uttarakhand	
2.	Peepal Koti HEP (444 MW)	Alaknanda	Peepal Koti/Uttarakhand	Under construction
3.	Srinagar HEP (330 MW)	Alaknanda	Srinagar/Uttarakhand	
4.	Tapovan Vishnuprayag HEP (520 MW)	Dhawli Ganga	Uttarakhand	Under construction
5.	Kund HEP	Mandakini	Uttarakhand	Mini HEP
Projects on Bhagirathi and its tributaries				
1.	Maneri Bhali Phase-I HEP (90 MW)	Bhagirathi	Uttarakhand	
2.	Maneri Bhali Phase-II HEP (304 MW)	Bhagirathi	Uttarakhand	
3.	Tehri HEP (1000 MW)	Bhagirathi	Uttarakhand	
4.	Koteshwar HEP (400 MW)	Bhagirathi	Uttarakhand	
5.	Ghansali HEP (23 MW)	Bhilangana	Uttarakhand	Mini HEP
6.	Rech HEP (8 MW)	Bhilangana	Uttarakhand	Mini HEP
7.	Buda Kedar HEP (5 MW)	Bal Ganga	Uttarakhand	Mini HEP
Projects on Ganga Main Stream				
1.	Pashulok Barrage, Rishikesh (Chilla HEP, 143 MW)	Ganga	Uttarakhand	
2.	Bhimgoda Barrage (Irrigation)	Ganga	Uttarakhand	SCADA system installed
3.	Madhya Ganga Barrage (Chaudhary Charan Singh Barrage) (Irrigation)	Ganga	Uttar Pradesh	
4.	Narora Barrage (Irrigation)	Ganga	Uttar Pradesh	SCADA system installed
5.	Kanpur Barrage (Drinking Water)	Ganga	Uttar Pradesh	

Table 3: Key projects on River Ganga up to Unnao.

Considering the extent of modifications of flows by the projects, following projects are being monitored presently for implementation of E-flows w.e.f. 1st January, 2019.

Sl. No.	Name of the Project	Agency
1.	Maneri Bhali Stage-I	UJVNL
2.	Maneri Bhali Stage –II	UJVNL
3.	Tehri Dam	THDC
4.	Koteshwar Dam	THDC
5.	Vishnuprayag HEP	JPVL
6.	Srinagar	GVK
7.	Pashulok Barrage/ Chilla HEP	UJVNL
8.	Bhimgoda Barrage	UP. Irrigation
9.	Bijnor Barrage	UP. Irrigation
10	Narora Barrage	UP Irrigation
11	Kanpur Barrage	UP Irrigation

Table 4: List of Projects being monitored presently.

Salient features of the above projects are enclosed at **Annex-III**.

5.0 DATA COLLECTION NETWORK AND TRANSMISSION SYSTEM

Status of data collection network and transmission system at above projects is as under:

Sl. No.	Name of the Project	Agency	Data Collection Network	Data Transmission system
1.	Maneri Bhali Stage-I	UJVNL	Manual	Through email
2.	Maneri Bhali Stage –II	UJVNL	Manual	Through email
3.	Tehri Dam	THDC	Automatic sensors	Through email/SMS
4.	Koteshwar Dam	THDC	Automatic sensors	Through email/SMS
5.	Vishnuprayag HEP	JPVL		Through email
6.	Pashulok Barrage/ Chilla HEP	UJVNL	manual	Through email
7.	Bijnor Barrage	UP. Irrigation	manual	Through email
8.	Srinagar	GVK		Through email
9.	Bhimgoda Barrage	UP. Irrigation	Automatic sensors	Through email. Also the data is in public domain
10	Narora Barrage	UP Irrigation	Automatic sensors	Through email
11	Kanpur Barrage	UP Irrigation	manual	Data not being received after 10.01.2019

6.0 CURRENT STATUS OF IMPLEMENTATION OF MINIMUM E-FLOWS

Project wise status of fulfilling the requirement of releasing stipulated environmental flows is given below:

6.1 MANERI BHALI PHASE-1

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily by email
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Except on few occasions, the outflows remained below mandated E-flows (20% of inflows)	In this regard, vide letter dated: 02.03.2019 project authorities have been requested to take necessary action for compliance
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Yet to be installed	The project authorities have been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter dated: 08.03.2019

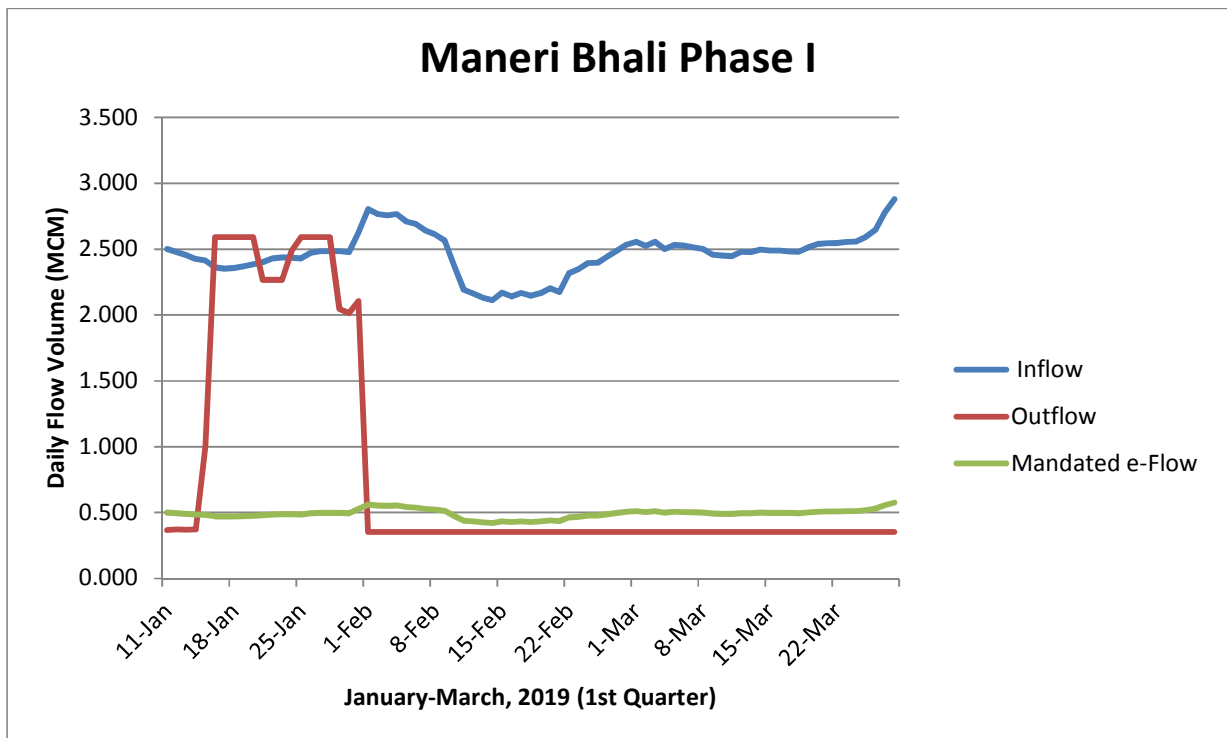


Figure 2: Graph showing status of implementation of e-flows at Maneri Bhali Phase I Project.

6.2 MANERI BHALI PHASE-2

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily by email
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Except on few occasions, the outflows remained below mandated E-flows (20% of inflows)	In this regard, vide letter dated: 02.03.2019 project authorities have been requested to take necessary action for compliance
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Yet to be installed	The project authorities have been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter dated: 08.03.2019

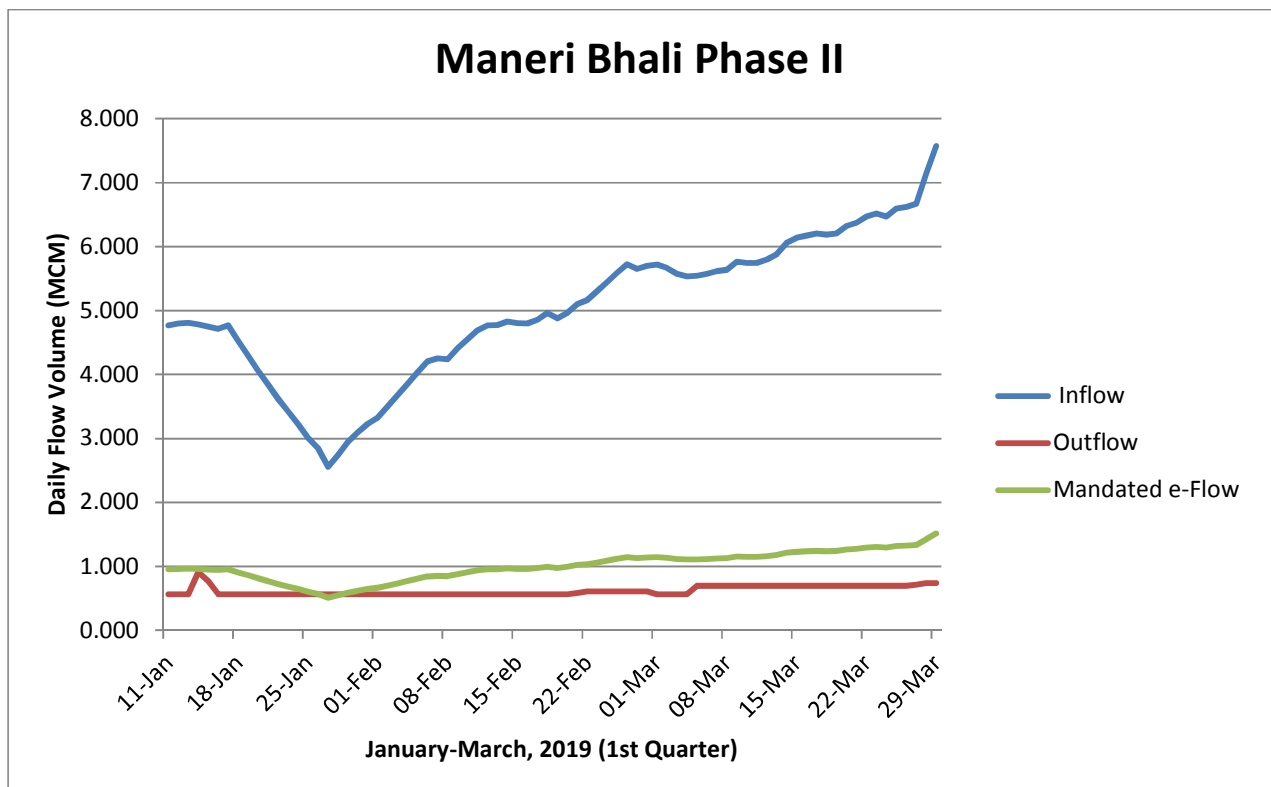


Figure 3: Graph showing status of implementation of e-flows at Maneri Bhali Phase II Project.

6.3 TEHRI DAM

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily wise
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Total Compliance	Flow data available from 22.02.2019 onwards
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Automatic sensors are installed in the penstocks of each generating machine	The project authority have been requested to devise a system for automatic data transmission to CWC

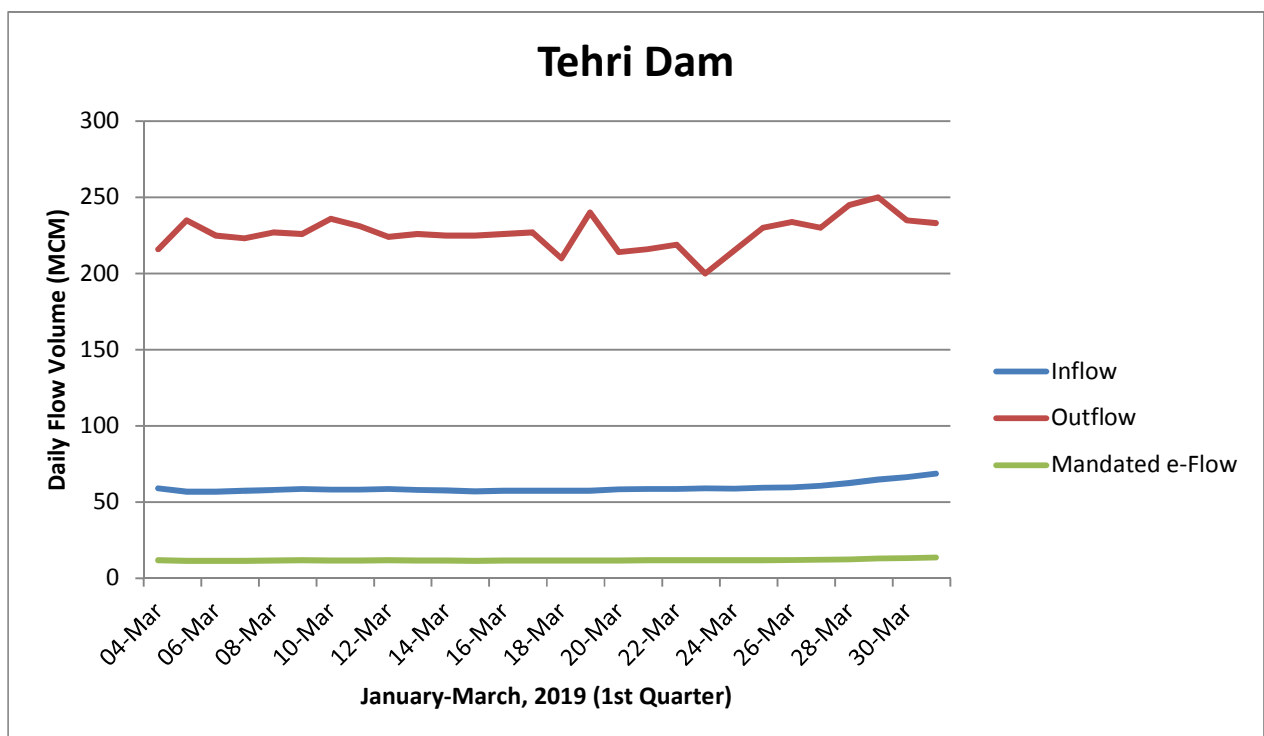


Figure 4: Graph showing status of implementation of e-flows at Tehri Dam.

6.4 KOTESHWAR DAM

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily wise
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Total Compliance	Flow data available from 22.02.2019 onwards
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Automatic sensors are installed in the penstocks of each generating machine	The project authority have been requested to devise a system for automatic data transmission to CWC

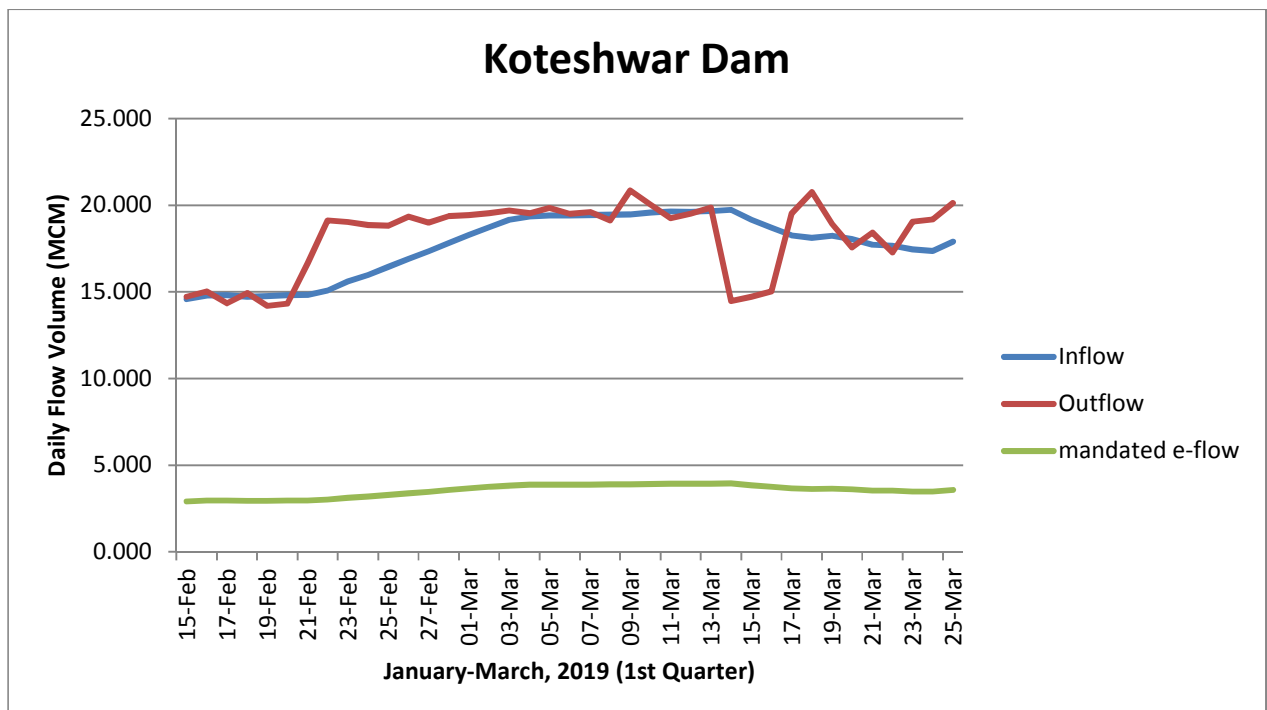


Figure 5: Graph showing status of implementation of e-flows at Koteshwar Dam.

6.5 VISHNUPRAYAG HEP

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily by email
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Not in Compliance	In this regard, vide letter dated: 02.03.2019 , the project authorities have been requested to take necessary action for compliance
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	No Response	The project authority has been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter No. 03/09/HGD/2015/863-76 dated: 08.03.2019

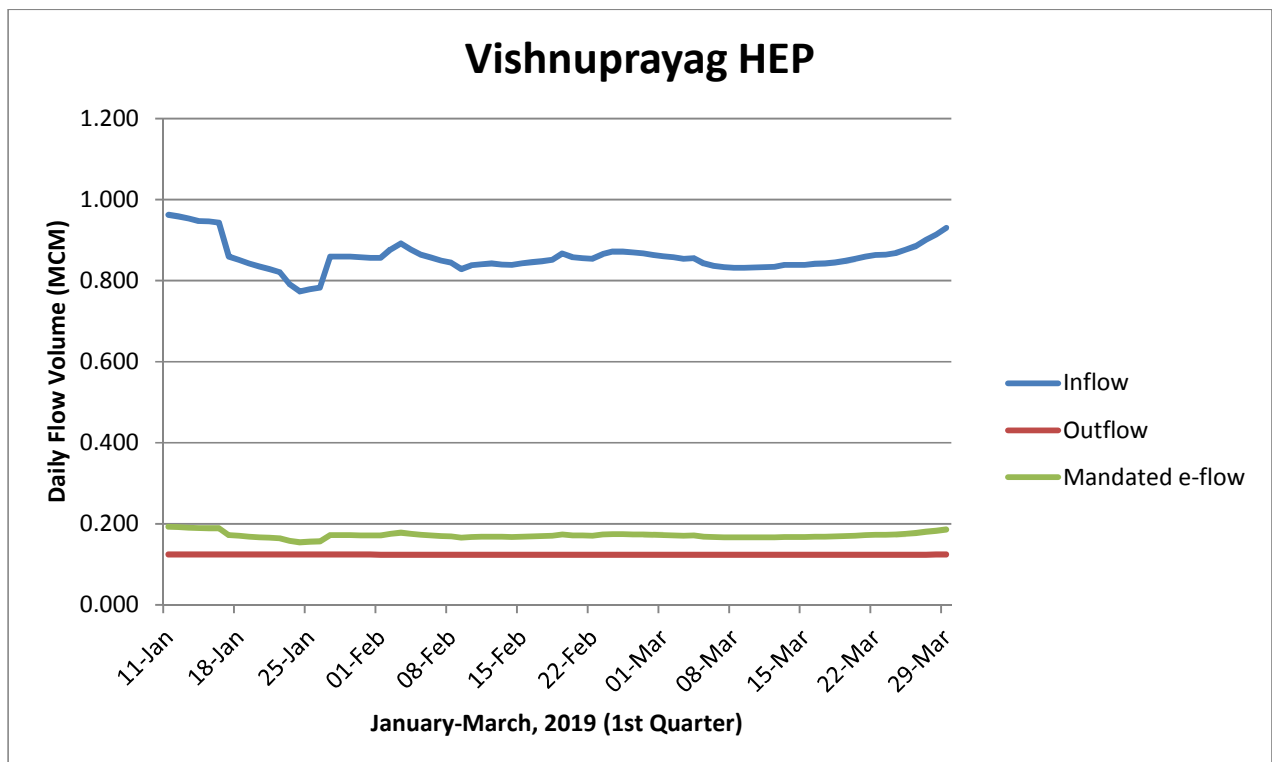


Figure 6: Graph showing status of implementation of e-flows at Vishnuprayag HEP.

6.6 SRINAGAR DAM

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily by email
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Not in Compliance	Data Available for January to February, 2019. No data given in March
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	No Response	The project authorities have been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter dated: 08.03.2019

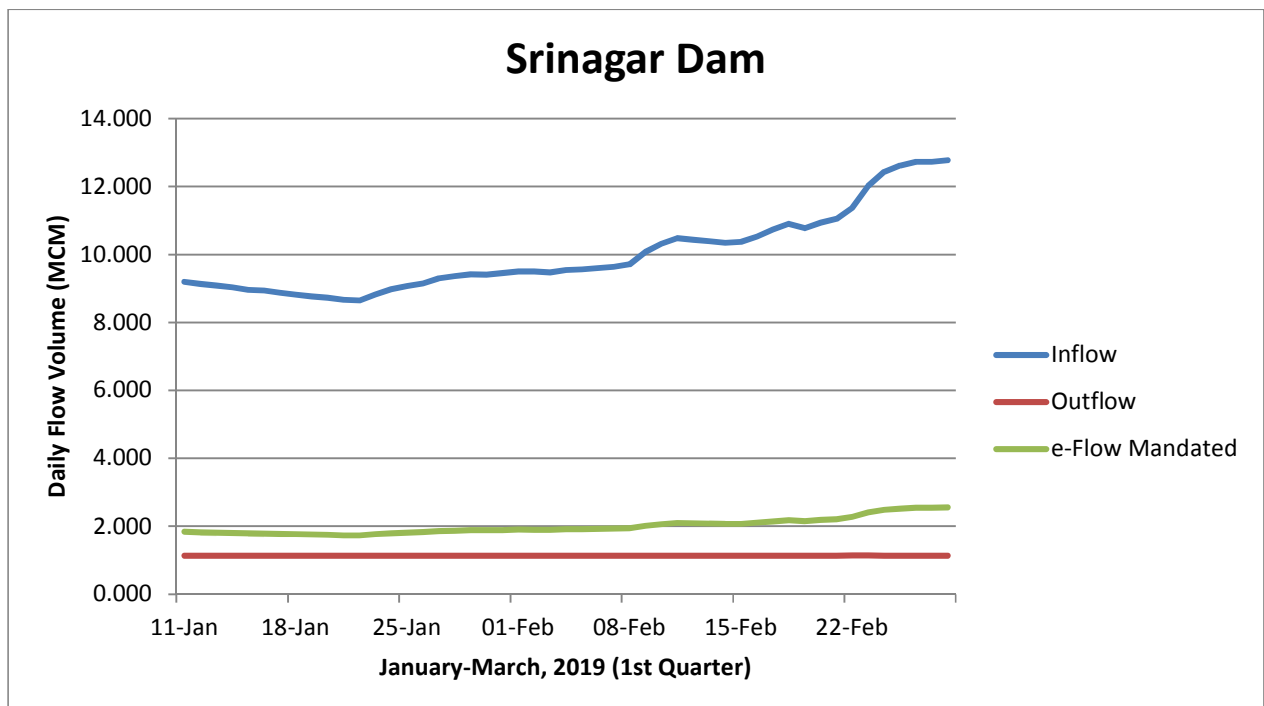


Figure 7: Graph showing status of implementation of e-flows at Srinagar Dam.

6.7 PASHULOK BARRAGE

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Flow Conditions are being monitored hourly	Hourly observed discharge log sheet is being sent to this office daily by email
In the Lean period Release of 20% of Monthly Average Flow observed during each of preceding 10-daily period	Except on few occasions in the beginning, the outflow remained above 20% lately	In this regard, a letter vide letter no. 03/09/HGD/2015/780-788 dated: 02.03.2019 had been sent to the project authority to take necessary action for compliance
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Yet to installed	The project authority has been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter dated: 08.03.2019

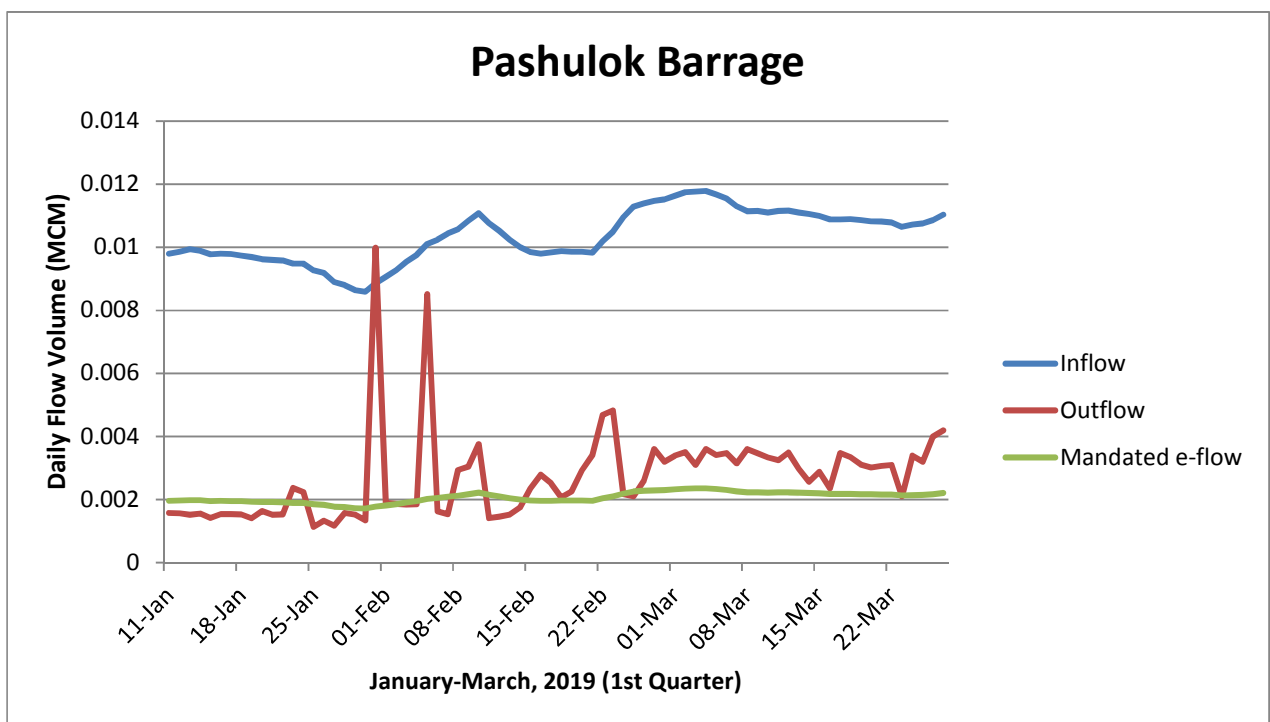


Figure 8: Graph showing status of implementation of e-flows at Pashulok Barrage.

6.8 BHIMGODA BARRAGE

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Hourly Data is not available	Data is being taken from online portal http://idup.deutek.in/haridwar/HaridwarDaily.html
In the Lean period, 36 cumec discharge is mandated	Total Compliance Except on few occasion that is due to missing data	Data is being taken from online portal http://idup.deutek.in/haridwar/HaridwarDaily.html
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Installed	The project authorities have been requested to devise a system for automatic transmission of the data in requisite form

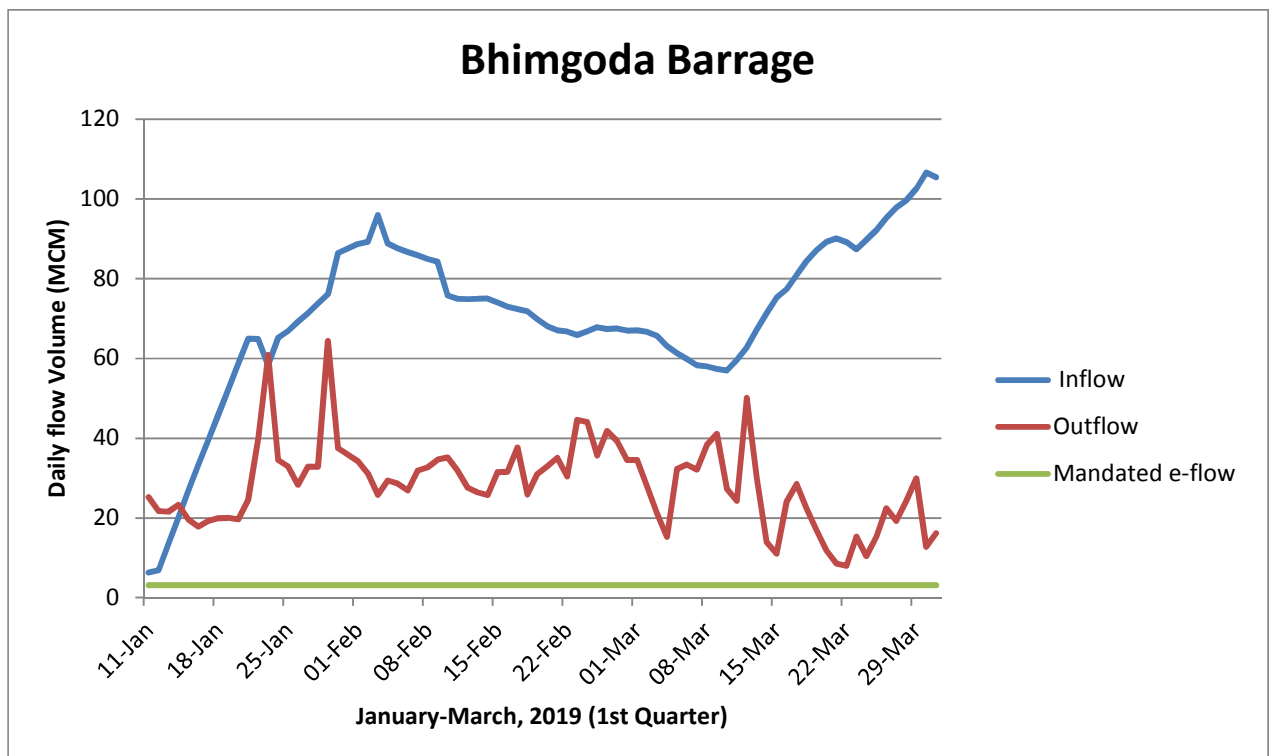


Figure 9: Graph showing status of implementation of e-flows at Bhimgoda Barrage.

6.9 BIJNOR BARRAGE

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time	Data not being received after 15.01.2019 (PDF Format)	Letters and reminders had been sent vide letter dated: 01.02.2019, 22.02.2019 & 01.04.2019
In the Lean period, 24 cumec discharge is mandated	Data not being received after 13.01.2019 (PDF Format)	
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	No Response	The project authorities have been asked to install the Automatic Data Acquisition and Transmission System for Inflow and Outflow vide letter dated: 08.03.2019

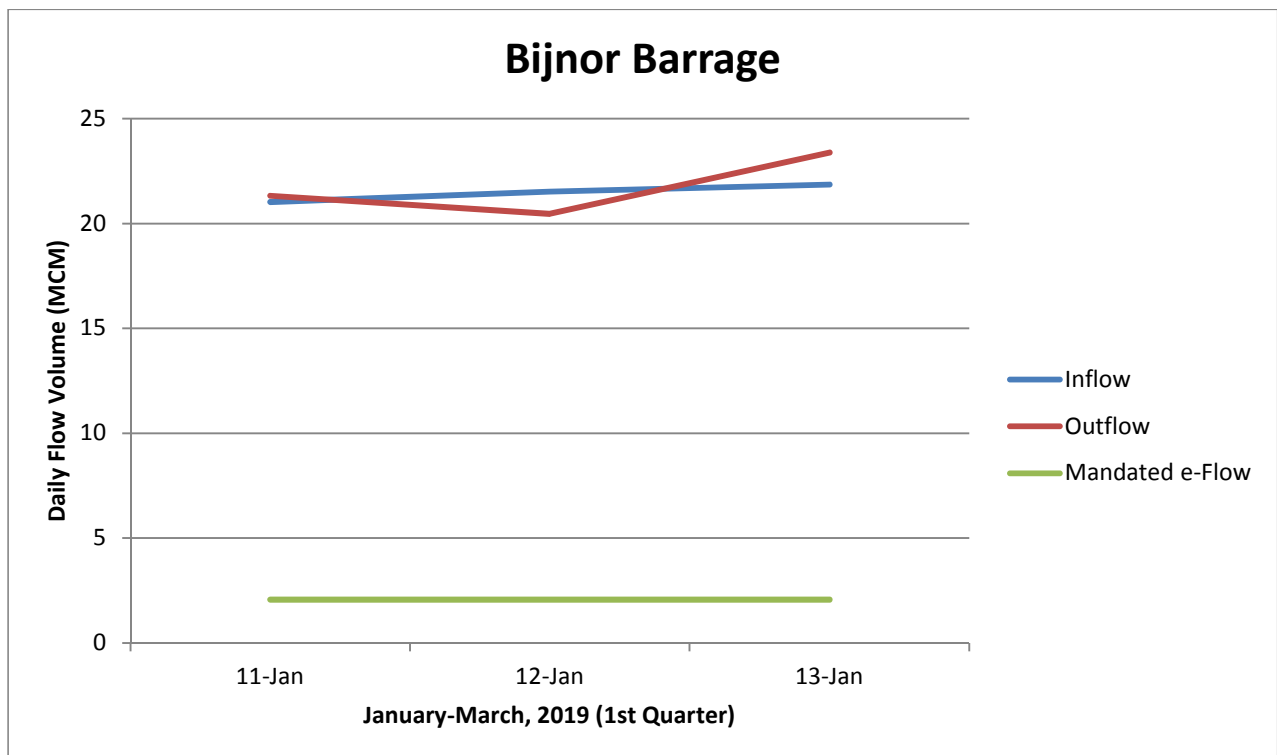


Figure 10: Graph showing status of implementation of e-flows at Bijnor Barrage.

6.10 NARORA BARRAGE

Requirement/mandate as per the Gazette Notification	Compliance Status	Remarks
Monitoring of Flow conditions at hourly intervals from time to time		Data is being taken from online portal http://idup.deutek.in
In the Lean period, 24 cumec discharge is mandated	Total Compliance	Data is being taken from online portal http://idup.deutek.in
Installation of Automatic Data Acquisition and Transmission System for Inflow and Outflow	Installed	The project authorities have been requested to devise a system for automatic transmission of the data in requisite form

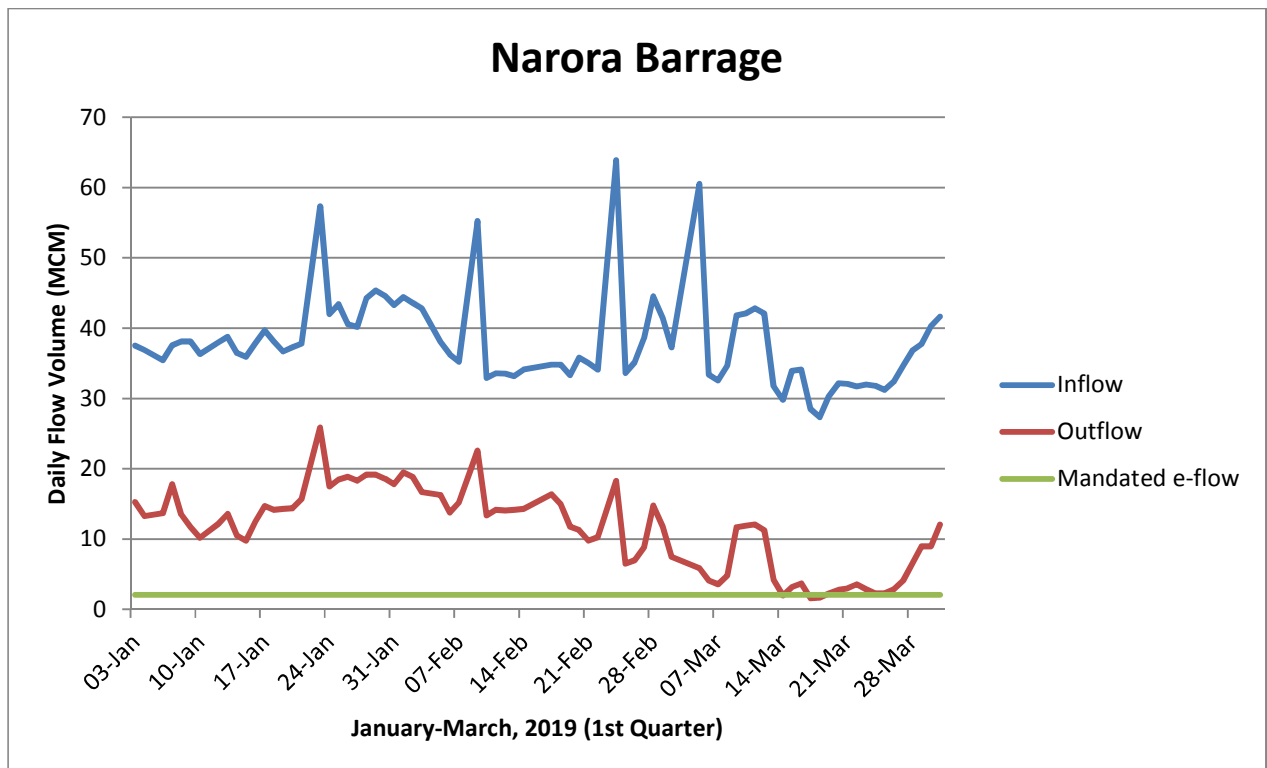


Figure 11: Graph showing status of implementation of e-flows at Narora Barrage.

7.0 CONCLUSIONS

7.1 Some of the projects are not providing the flow data in requisite format and frequency on regular basis despite perusing the matter with project authorities and state authorities. Data for Kanpur and Bijnor barrages are not being received yet.

7.2 In some of the projects namely Tehri Dam, Koteshwar Dam, Bhimgoda barrage and Narora barrage, automatic data acquisition system is already in place. Project authorities of these projects have been requested to devise a system for automatic data transmission to CWC in desired format and frequency. Other project authorities have not initiated necessary action for installation of automatic data acquisition and transmission system. Accordingly, the matter is being pursued vigorously with project authorities to install automatic data acquisition and transmission system.

7.3 Based on the data supplied by project authorities, the following four projects are not meeting the mandated E-flow requirements for most of the period:

- **Maneri Bhali Stage 1**
- **Maneri Bhali Stage 2**
- **VishnuPrayag HEP**
- **Srinagar HEP**

Pashulok Barrage are in partial compliance i.e. on some occasions, the outflows were below the mandated e-flow requirement. In case of Bijnor and Kanpur barrages, though flow data are not being received, there are adequate flow releases downstream of the two barrage to meet the mandated E-flow requirements as seen from observations at CWC sites in downstream.


भारत का राजपत्र
The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

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जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

(राष्ट्रीय स्वच्छ गंगा मिशन)

आदेश

नई दिल्ली, 9 अक्तूबर, 2018

का.आ. 5195(अ).—गंगा नदी अत्यधिक पवित्र और इस देश के लोगों द्वारा अत्यंत पूजनीय है तथा गंगा नदी बेसिन जल ग्रहण क्षेत्र के निबंधनानुसार भारत में बृहत्तम नदी बेसिन है, जिसमें संपूर्ण देश की छद्मिप्त प्रतिशत भूमि सम्मिलित है तथा जो लगभग पचास करोड़ जनसंख्या के लिए पोषणीय है;

और गंगा नदी विशेष गुणों, विशिष्टताओं तथा महत्व के रूप में अद्वितीय है जिसका महत्वपूर्ण लौकिक और स्थानिक प्रभाव भिन्नता के साथ जल-विज्ञान, भू-आकृतिविज्ञान, ऐतिहासिक, सामाजिक-सांस्कृतिक और आर्थिक कारण हैं;

और गंगा नदी को राष्ट्रीय नदी का दर्जा दिया गया है तथा नदी-प्रणाली में सिंचाई, घरेलू, औद्योगिक और अन्य प्रयोजनों के लिए बेसिन में सदैव पानी की बढ़ती मांग के साथ घरेलू अपशिष्ट और आद्योगिक अपशिष्ट सहित विभिन्न स्रोतों से प्रदूषण प्रवेश कर रहा है, जो नदी के स्वास्थ्य को लंबे समय से प्रभावित कर रहा है;

और भारत सरकार समुचित पर्यावरण प्रवाह तथा साथ ही नदी में प्रदूषण के प्रवेश के निवारण को सुनिश्चित करने के लिए नदियों की पौष्टिकता की वहाली करने और उसे बनाए रखने के लिए वचनबद्ध है;

और यह सुनिश्चित करना आवश्यक है कि गंगा नदी में हर समय पानी के निर्बाध प्रवाह को पूरी तरह से बनाए रखा जाए, जिससे मौसमी भिन्नताओं को बदले बिना नदी में प्रवाह की निरंतरता सुनिश्चित हो सके;

केंद्रीय सरकार ने पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) के अधीन अधिसूचना का.आ. 3187 (अ), तारीख 7 अक्तूबर, 2016 द्वारा गंगा नदी जलक्षेत्र के संरक्षण, संरक्षा और प्रबंध तथा निम्नलिखित प्रयोजनों के लिए एक प्राधिकरण अर्थात् राष्ट्रीय स्वच्छ गंगा मिशन का गठन किया था, अर्थात्:-

(क) गंगा नदी और उसकी सहायक नदियों के जल की गुणवत्ता और पर्यावरणीय बहनीय संरक्षण, संरक्षा और प्रबंध को सुनिश्चित करने के उद्देश्य से सतैव विभिन्न क्षेत्रों में विभिन्न विंदुओं पर बनाए रखने के लिए अपेक्षित गंगा नदी और उसकी सहायक नदियों में पारिस्थितिक

प्रवाह के परिमाण को अवधारित करवाने तथा उसे अधिसूचित करवाने और पर्याप्त पारिस्थितिक प्रवाह को बनाए रखने के लिए ऐसे सभी आवश्यक कदम उठाना या निर्देशित करना;

(ख) गंगा नदी के जलीय प्रेक्षण स्टेशनों के माध्यम से विनिर्दिष्ट बिंदुओं पर पानी के औसत प्रवाह को विनिर्दिष्ट करना;

(ग) गंगा नदी तथा उसकी सहायक नदियों में जल के प्रवाह की निरंतर मानीटरी के लिए तंत्र विकसित करना;

और केंद्रीय सरकार ने गंगा नदी और उसकी सहायक नदियों में कतिपय प्रवाहों को निर्धारित करने का विनिश्चय किया है।

2. अतः केंद्रीय सरकार, गंगा नदी (संरक्षण, सुरक्षा एवं प्रबंधन) प्राधिकरण आदेश, 2016 के पैरा 39 के उपपैरा (3) और पैरा 41 के उपपैरा (2) की मद (ज) के साथ पठित पर्यावरण संरक्षण अधिनियम, 1986 की धारा 3 की उपधारा (3) द्वारा प्रदत्त शक्तियों का प्रयोग करने हुए, सिंचाई, जल विद्युत्, घरेलू और औद्योगिक प्रयोजनों तथा अन्य अपेक्षाओं के लिए नदी प्रवाह को परिवर्तित करने के लिए संरचनाओं या परियोजनाओं के निम्न प्रवाह अवस्थानों पर न्यूनतम पर्यावरणीय प्रवाहों को बनाए रखने के लिए अधिसूचित करती है, अर्थात्:-

1. देवप्रयाग से हरिद्वार तक अंत में मिलने वाले क्रमवर्ती मम्मिलनों के माध्यम से और उद्भव वाले ग्लेशियरों से आरंभ होने वाला उपरी गंगा नदी बेसिन विस्तार:

क्रम सं.	ऋतु	मास	प्रत्येक पूर्ववर्ती 10 दैनिक अवधि के दौरान प्रेक्षित मासिक औसत प्रवाह का प्रतिशत(%)
1.	शुष्क	नवंबर से मार्च	20
2.	क्षीण	अक्तूबर, अप्रैल और मई	25
3.	उच्च प्रवाह ऋतु	जून से सितंबर	30*#

*उच्च प्रवाह ऋतु के मासिक प्रवाह का 30%

II. हरिद्वार, उत्तराखंड से उन्नाव, उत्तर प्रदेश तक गंगा नदी के मुख्य मार्ग का विस्तार:

क्रम सं.	बैराज की अवस्थिति	बैराजों के सन्निकट निम्न धारा को निर्मुक्त करने वाला न्यूनतम प्रवाह (क्यूमैक्स में) (अक्तूबर से मई)	बैराजों के सन्निकट निम्न धारा को निर्मुक्त करने वाला न्यूनतम प्रवाह (क्यूमैक्स में) (जून से सितंबर)
(1)	भीमगौड़ा (हरिद्वार)	36	57
(2)	विजनौर	24	48
(3)	नरौरा	24	48
(4)	कानपुर	24	48

क्यूमैक्स-घनमीटर प्रतिसेकंड।

III. उपरोक्त उक्त पारिस्थितिकी प्रवाह निम्न के अधधीन हैं, अर्थात्:-

(i) न्यूनतम पर्यावरणीय प्रवाह का अनुपालन सभी विद्यमान, निर्माणाधीन और भविष्य की परियोजनाओं को लागू होता है;

(ii) विद्यमान परियोजनाएं जो वर्तमान में इन पर्यावरणीय प्रवाहों के मानदंडों के अनुरूप नहीं हैं, इनका पालन करेंगी और यह सुनिश्चित करेंगी कि वांछित पर्यावरणीय प्रवाह मानदंडों का पालन इस अधिसूचना के जारी करने की तारीख से तीन वर्ष की अवधि के भीतर किया जाए;

(iii) परियोजना जो सन्निर्माण की विभिन्न प्रक्रम पर हैं, जहां जमीनी भौतिक प्रगति आरंभ हो चुकी है और समुचित प्राधिकारी को रिपोर्ट की गई है, परियोजना को आरंभ करने के पूर्व और उसके पश्चात् अनुबद्ध पर्यावरणीय प्रवाह को बनाए रखने के लिए भी आवश्यक उपबंध करेंगी;

(iv) लघु और सूक्ष्म परियोजनाएं जो सारवान रूप से नदी या धारा की प्रवाही विशेषताओं को परिवर्तित नहीं करती हैं, इन परियावरणीय प्रवाहों में छूट प्राप्त हैं;

(v) परिवारणीय प्रवाहों को बनाए रखने के लिए जल की बांझनीय मात्राओं की निर्मुक्ति को सुनिश्चित करने के लिए, इन नदी आगमों में प्रवाह की दशाएं समय-समय पर कालिक अंतरालों पर मानीटर की जाएंगी;

(vi) केंद्रीय जल आयोग अभिहित प्राधिकारी तथा डाटा का संरक्षक होगा तथा प्रवाहों के पर्यवेक्षण, मानीटरिंग, विनियमन तथा जब कभी अपेक्षित हो, समुचित प्राधिकारी को आवश्यक जानकारी रिपोर्ट करने के लिए उत्तरदायी होगा। यह किसी आपात स्थिति की दशा में जल भंडारण मानदंडों के बारे में तत्काल निर्णय लेने के लिए भी प्राधिकृत है। केंद्रीय जल आयोग त्रैमासिक आधार पर राष्ट्रीय स्वच्छ गंगा मिशन को प्रवाह मानीटरी-सह-अनुपालन रिपोर्ट प्रस्तुत करेगा;

(vii) संबंधित परियोजना विकासकर्ता या प्राधिकारी इस अधिसूचना की तारीख से छह मास के भीतर केंद्रीय जल आयोग विनिर्दिष्ट उचित अवस्थानों पर परियोजना स्थलों पर स्वचालित डाटा अर्जन और डाटा प्रेषण प्रसुविधाएं या अपेक्षित आवश्यक अवसंरचना लगाएगा। प्रवाह मानीटरी प्रसुविधा को लगाने, अंशांकन करने, उसे बनाए रखने का उत्तरदायित्व परियोजना विकासकर्ताओं या प्राधिकारियों का होगा और वे समय-समय पर केंद्रीय जल आयोग को डाटा प्रस्तुत करेंगे;

(viii) केंद्रीय सरकार, राष्ट्रीय स्वच्छ गंगा मिशन के माध्यम से, जब कभी अपेक्षित हो, गंगा नदी में विशेष मांग को पूरा करने के लिए अतिरिक्त जल को निर्मुक्त करने का निदेश दे सकेगी।

IV. संबंधित केंद्रीय और राज्य प्राधिकरण, सिंचाई का प्रभावी ढंग, जल का पुनः उपयोग और पुनः चक्रण, जिसके अंतर्गत विभिन्न प्रयोजनों के लिए भूजल निकालने की मानीटरिंग और विनियमन भी है, जैसे अच्छे और वैज्ञानिक व्यवहारों को अपना कर गंगा नदी के जल निकालने में कमी करने के लिए मांग पक्ष प्रबंध योजना कार्यान्वित करेंगे।

3. यह आदेश इसके राजपत्र में प्रकाशन की तारीख से प्रवृत्त होगा।

4. यह आदेश उद्धव वाले ग्लेशियरों से आरंभ होने वाले उपरी गंगा नदी बेसिन तथा देवप्रयाग से हरिद्वार तक और उत्तर प्रदेश के उन्नाव जिले तक गंगा नदी की मुख्य धारा को तथा अंत में मिलने वाली इसकी मुख्य सहायक नदियों के क्रमवर्ती सम्मिलनों पर लागू होगा।

[फा. सं. - Estt.01/2016-17/111/NMCG (Vol III)]

राजीव किशोर, कार्यकारी निदेशक (प्रशा.)

**MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION
(NATIONAL MISSION FOR CLEAN GANGA)**

ORDER

New Delhi, the 9th October, 2018

S.O.5195(E).—Whereas, the River Ganga is the most sacred and deeply revered by the people of this country and the Ganga river basin is the largest river basin in India in terms of catchment area, constituting twenty six per cent of the country's land mass and supporting about half a billion population;

And whereas, River Ganga is unique as having special properties, features and importance, holding reasons that are hydrological, geomorphological, historical, socio-cultural and economical with significant temporal and spatial flow variation;

And whereas, River Ganga has been given status of a National river and the ever increasing demand for water in the basin for irrigation, domestic, industrial and other purposes coupled with pollution ingress from different sources including domestic waste, industrial waste, into river system is affecting the health of the said river for long;

And whereas, the Central Government is committed to restore and maintain the wholesomeness of the rivers ensuring appropriate environment flows and simultaneously preventing the pollution ingress into the said river;

And whereas, it is considered necessary to ensure that uninterrupted flows of water are maintained throughout its length at all times in River Ganga to ensure continuity of flows in the river without altering the seasonal variations;

And whereas the Central Government *vide* notification S.O. 3187(E), dated the 7th October, 2016 under the Environment (Protection) Act, 1986 (29 of 1986) has constituted an authority, namely, the National Mission for Clean Ganga for Rejuvenation, Protection and Management of River Ganga basin for the following purposes, namely:-

- (a) to determine the magnitude of ecological flow in the River Ganga and its tributaries required to be maintained at different points in different areas at all times with the aim of ensuring water quality and environmentally

sustainable rejuvenation, protection and management of River Ganga and its tributaries and notifying the same and take or direct all such measures necessary to maintain adequate ecological flows;

- (b) to specify the average flow of water at specified points through Hydrological Observation Stations of the River Ganga;
- (c) to devise a system for continuous monitoring of flow of water in the River Ganga and its tributaries;

And whereas the Central Government has decided to determine certain flows in the River Ganga and its tributaries;

2. Now, therefore, in exercise of the powers conferred by sub-section (3) of section 3 of the Environment (Protection) Act 1986 and read with sub paragraph (3) of paragraph 39 and item(h) of sub-paragraph(2) of paragraph 41 of the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, the Central Government hereby notifies the following minimum environmental flows to be maintained at locations downstream of structures or projects meant for diversion of river flows for purposes like irrigation, hydropower, domestic and industrial and other requirements, namely:-

- I. **Upper Ganga River Basin Stretch** starting from originating glaciers and through respective confluences finally meeting at Devaprayag up to Haridwar:

Sl. No.	Season	Months	(%) Percentage of Monthly Average Flow observed during each of preceding 10-daily period
1	Dry	November to March	20
2	Lean	October, April and May	25
3	High Flow season	June to September	30**

** 30% of monthly flow of High flow season.

- II. **Stretch of main stem of River Ganga from Haridwar, Utrakhand to Unnao, Uttar Pradesh**

S. No.	Location of Barrage	Minimum flow releases immediately downstream of barrages (In Cumecs) Non-Monsoon (October to May)	Minimum flow releases immediately downstream of barrages (In Cumecs) Monsoon (June to September)
(1)	Bhimgoda (Haridwar)	36	57
(2)	Bijnor	24	48
(3)	Narora	24	48
(4)	Kanpur	24	48

Cumec – Cubic Meter per second.

- III. The above said ecological flows are subject to the following, namely:-

- (i) the compliance of minimum environmental flow is applicable to all existing, under-construction and future projects;
- (ii) the existing projects, which currently do not meet the norms of these environmental flows, shall comply and ensure that the desired environmental flow norms are complied within a period of three years from the date of issue of this order;

- (iii) the project which is at different stages of construction, where physical progress on ground has been initiated and made and reported to appropriate authority shall also make necessary provisions to maintain the stipulated environmental flow before and after commissioning of the project;
 - (iv) the mini and micro projects which do not alter the flow characteristics of the river or stream significantly are exempted from these environmental flows;
 - (v) to ensure the release of desired quantities of water to maintain environmental flows, flow conditions in these river reaches shall be monitored at hourly intervals from time to time;
 - (vi) the Central Water Commission shall be the designated authority and the custodian of the data and shall be responsible for supervision, monitoring, regulation of flows and reporting of necessary information to the appropriate authority as and when required and also authorised to take emergent decisions about the water storage norms in case of any emergency. The Central Water Commission shall submit flow monitoring-cum-compliance report on quarterly basis to National Mission for Clean Ganga;
 - (vii) the concerned project developers or authorities shall install automatic data acquisition and data transmission facilities or required necessary infrastructure at project sites at appropriate locations specified by the Central Water Commission within six months from the date of this order. The installation, calibration, maintenance of flow monitoring facility shall be the responsibility of the project developers or authorities and they shall submit the data to the Central Water Commission from time to time;
 - (viii) the Central Government through National Mission for Clean Ganga may direct release of additional water in the River Ganga to meet special demand as and when required.
- IV. The concerned Central and State authorities shall implement demand side management plans to reduce water withdrawal from River Ganga by adopting good and scientific practices such as efficient method of irrigation, reuse and recycle of water including monitoring and regulation of ground water withdrawals for various purposes.
3. This Order shall come into force on the date of its publication in the Official Gazette.
 4. This Order shall apply to the upper Ganga River Basin starting from originating glaciers and through respective confluences of its head tributaries finally meeting at Devaprayag up to Haridwar and the main stem of River Ganga up to Unnao district of Uttar Pradesh

[F. No.- Estt.01/2016-17/111/NMCG(Vol III)]

RAJIV KISHORE, Executive Director(Admn)

Hydro Projects being Developed by CPSUs in Uttarakhand State

SR. NO.	NAME OF THE PROJECT	CAPACITY IN MW	DISTRICT	RIVER VALLEY	TRIBUTARY	NAME OF AGENCY
1	Tehri PSP	1000.00	Tehri	Bhagirathi	Bhagirathi	THDC
2	Tapovan Vishnugad	520.00	Chamoli	Alaknanda	Dhauliganga	NTPC
3	Vishnugad Pipalkoti	444.00	Chamoli	Alaknanda	Alaknanda	THDC
4	Lata Tapovan	171.00	Chamoli	Alaknanda	Dhauliganga	NTPC
5	Naitwar mori	60.00	Uttarkashi	Yamuna	Tons	SJVNL
6	Devsari Dam	252.00	Chamoli	Alaknanda	Pindar	SJVNL
7	Kothi Bhel - IA	195.00	Tehri	Bhagirathi	Bhagirathi	NHPC
8	Rusiya Bagar Khasiyabara	260.00	Pithoragarh	Gauriganga	Gauriganga	NTPC
9	Kothi Bhel - IB	320.00	Pauri (G)	Alaknanda	Alaknanda	NHPC
10	Kothi Bhel - II	530	Pauri (G)	Ganga	Ganga	NHPC
11	Jakhol Sankri	51.00	Uttarkashi	Yamuna	Tons	SJVNL
12	Jhelam Tamak	108.00	Chamoli	Alaknanda	Dhauliganga	THDC
13	Maleri Jhelam	65.00	Chamoli	Alaknanda	Dhauliganga	THDC
14	Gohana Tal	50.00	Chamoli	Alaknanda	Birehiganga	THDC
15	Gauriganga III A	120.00	Pithoragarh	Gauriganga	Gauriganga	NHPC
16	Dhauliganga Intermediate Stage	210.00	Pithoragarh	Dhauri Ganga	Dhauliganga	NHPC
17	Karmoli Lumti Talli	55.00	Pithoragarh	Gauriganga	Gauriganga	NHPC
18	Chungar Chal	240.00	Pithoragarh	Dhauri Ganga	Dhauliganga	NHPC
19	Garba Tawaghat	630.00	Pithoragarh	Sharda	Sharda	NHPC
20	Karmoli	140.00	UttarKashi	Bhagirathi	Jadhganga	THDC
21	Jadhganga	50.00	UttarKashi	Bhagirathi	Jadhganga	THDC
22	Bokang Bailing	330.00	Pithoragarh	Dhauri Ganga	Dhauliganga	THDC
	Total	5801.00	MW			

Hydro Projects being Developed by IPPs in Uttarakhand State

S.N.	Name of Project	Estimated Potential (MW)	District	River/ Tributary	Developer
1	Rayat	6	Tehri	Aglar gad	Aglar Pvt.Ltd.
2	Bgyunder Ganga	24.3	Chamoli	Bgyunder Ganga	Super Hydro Pvt Ltd
3	Phata- Byung	76	Rudraprayag	Mandakini	Lanco Kondapalli
4	Singoli-Bhatwari	99	Rudraprayag	Mandakini	L&T Power
5	Hanuman Ganga Ext. II	1.9	Uttarkashi	Hanuman ganga	Regency Aqua
6	Lagrasu	3	Tehri	Aglar	Aglar Pvt.Ltd.
7	Burthing	6.5	Pithoragarh	Eastern Ramganga	M/S Energy Development Company
8	Phuliabagar	5	Pithoragarh	Eastern Ramganga	M/S Energy Development Company
9	Balighat	5.5	Bageshwar	Sarju	M/S Energy Development Company
10	Barnigad	22.8	Uttarkashi	Yamuna	K Ramchandra Rao
11	Kot-Buda Kedar	6	Tehri	Bhilangana	Gunsola Hydro
12	Jhala Koti	12.5	Tehri	Dharam Ganga	Gunsola Hydro
13	Khirao ganga	4	Uttarkashi	khiroganga	Super Hydro Pvt. Ltd.
14	Devali	13	Chamoli	Nandakini	Hima Urja Pvt Ltd.
15	Kailganga	5	Chamoli	Pinder	Chamoli Hydro Pvt Ltd.
16	Hanol Tuni	60	Uttarkashi	Tons	Sunflag Power
17	Kakora Gad	12.5	Uttarkashi	Bhagirathi	Harsil Hydro
18	Jalandhari Gad	24	Uttarkashi	Bhagirathi	Harsil Hydro
19	Siyangad	11.5	Uttarkashi	Bhagirathi	Harsil Hydro
20	Alaknanda	300	Chamoli	Alaknanda	GMR Energy
21	Melkhet	24	Chamoli	Pinder	Melkhet Power
22	Sarju Stage-I	7.5	Bageshwar	Sarju	Uttar Bharat Power Pvt. Ltd
23	Khutani	21	Bageshwar	Sarju	Shayama Power
24	Rambara	76	Rudraprayag	Mandakini	Lanco Kondapalli
25	Birahi Ganga-I	24	Chamoli	Birahiganga	PES Engineering
26	Balgad	19.80	Pithoragarh	Eastern Ramganga	Balgad Power Company Ltd.
27	Madkini	21	Pithoragarh	Madkini	Madkini hydro Power Ltd.
28	Mori-Hanol	63	Uttarkashi	Tons	Krisna Knitwear
29	Rupin Stage III	8	Uttarkashi	Rupin	Tons Hydro
30	Rupin Stage IV	10	Uttarkashi	Rupin	Tons Hydro
31	Rupin Stage V	24	Uttarkashi	Tons	Tons Hydro
32	Birahi Ganga-II	24	Chamoli	Birahiganga	PES Engineering
33	Urthing Sobla	340	Pithoragarh	Dhauliganga	Reliance Energy
	Total	1360.8	MW		

Hydro Projects Under Operation in Uttarakhand State

S.No.	Name of Project	Estimated Potential (MW)	District	River/Tributary	Agency
1	Maneri Bhali Stage - II	304	Uttarkashi	Bhagirathi	UJVNL
2	Chibro	240	Dehradun	Tons	UJVNL
3	Ramganga	198	Pauri	Ramganga	UJVNL
4	Chilla	144	Pauri	Ganga	UJVNL
5	Khodri	120	Dehradun	Tons	UJVNL
6	Tiloth	90	Uttarkashi	Bhagirathi	UJVNL
7	Dhalipur	51	Dehradun	Yamuna	UJVNL
8	Khatima	41.4	U.S. Nagar	Sarda	UJVNL
9	Dhakrani	33.75	Dehradun	Yamuna	UJVNL
10	Kulhal	30	Dehradun	Yamuna	UJVNL
11	Pathari	20.4	Hardwar	Upper ganga Canal	UJVNL
12	Mohmadpur	9.3	Hardwar	Upper ganga Canal	UJVNL
13	Galogi	3	Dehradun	Bhattafall	UJVNL
14	Urgam	3	Chamoli	Kalpganga	UJVNL
15	Dunao	1.5	Pauri	Eastern Nayar	UJVNL
16	Tanakpur	120.00	Champawat	Sharda	NHPC
17	Dhaulti Ganga	280.00	Pithoragarh	Dhaulti Ganga	NHPC
18	Tehri Dam	1000.00	Tehri	Bhagirathi	THDC
19	Koteshwar Dam	400.00	Tehri	Bhagirathi	THDC
20	Rajwakti	3.6	Chamoli	Nandakini	Him Urja Pvt Ltd
21	Hanuman Ganga	4.95	Uttarkashi	Hanuman ganga	Regency Aqua
22	Vishnuprayag	400	Chamoli	Alaknanda	JPVL
23	Deval	5	Chamoli	Pinder	Chamoli Hydro Pvt Ltd.
24	Loharkhet	4.8	Bageshwar	Lohar Khet	Parvatiya Power Pvt Ltd.
25	Agunda Thati	3	Tehri	Balganga	Gunsola Hydro
26	Vanala	15	Chamoli	Banala	Hima Urja Pvt Ltd.
27	Bhilingana	22.5	Tehri	Bhilingana	Swasti Power
28	Motighat	5	Pithoraharh	Sheraghat	Himalaya Hydro (P) Ltd.
29	Birahiganga	7.2	Chamoli	Birahiganga	Birahignaga Hydro
30	Rishiganga	13.2	Chamoli	Rishiganga	Rishiganga Power
31	Bhilingna III	24	Uttarkashi	Bhilingana	Bhilingana Hydro Power Ltd
32	Gangani	8	Uttarkashi	Gangani	Regency Gangani Energy
33	Sarju Stage-III	10.5	Bageshwar	Sarju	Uttar Bharat Power Pvt. Ltd
34	Badyar	4.9	Uttarkashi	Badyar gad	Regency Yamuna Energy
35	Srinagar	330	Pauri	Alaknanda	GVK
36	Sarju Stage-II	15	Bageshwar	Sarju	Uttar Bharat Power Pvt. Ltd
37	Tanga	5	Pithoragarh	Sheraghat	Himalaya Hydro (P) Ltd.
Total		3971			

Hydro Projects Being Developed by UJVNL

S.No.	Name of Project	Estimated Potential (MW)	District	River/Tributary
1	Vyasi	120	Dehradun	Yamuna
2	Lakhwar	300	Dehradun	Yamuna
3	Pala Maneri	480	Uttarkashi	Bhagirathi
4	Bharon Ghati	381	Uttarkashi	Bhagirathi
5	Bowla Nandprayag	300	Chamoli	Alaknanda
6	Nand Pyayag Langasu	100	Chamoli	Alaknanda
7	Tamak lata	280	Chamoli	Dhauliganga
8	Sarkari Bhyol Rupsiabagar	120	Pithoragarh	Goriganga
9	Sela Urthing	230	Pithoragarh	Dhauliganga
10	Taluka Sankri	140	Uttarkashi	Tons
11	Rishiganga I	70	Chamoli	Rishiganga
12	Rishiganga II	35	Chamoli	Rishiganga
13	Madhmaheshwar	15	Rudrprayag	Madhmaheshwar
14	Kaldigad	9	Uttarkashi	Kaldigad
15	Kaliganga-II	6	Rudrprayag	Kaliganga
16	Asiganga-I	4.5	Uttarkashi	Asiganga
17	Kaliganga-I	4	Rudrprayag	Kaliganga
18	Sobla I	8	Pithoragarh	Sobla
19	Asiganga-II	4.5	Uttarkashi	Asiganga
20	Dunao	1.5	Pauri	Eastern Nayar
21	Suwarigad	2	Uttarkashi	Bhagirathi
22	Limchagad	3.5	Uttarkashi	Bhagirathi
23	Tankul	12	Pithoragarh	Shyamkholigad
24	Painagad	4	Pithoragarh	Painagad
25	Pilangad-II	4	Uttarkashi	Pilangad
26	Urgam-II	3.8	Chamoli	Kalpganga
27	Asiganga-III	7.5	Uttarkashi	Asiganga
28	Suringad-II	5	Pithoragarh	Suringad
29	Songad	3	Pithoragarh	Songad
30	Bhilangana II - A	24	Tehri	Bhilangana
31	Bhilangana II - B	24	Tehri	Bhilangana
32	Bhilangana II - C	24	Tehri	Bhilangana
	Total	2725.3		

Salient Features of Maneri Bhali Phase I		
	Attribute	Value
1	Name of Barrage/ Weir/ Anicut	Joshiyara Barrage
2	River	Bhagirathi
3	Basin	Ganga
4	Nearest City	Bhatwari
5	District	Uttarkashi
6	State	Uttarakhand
7	Status	Completed
8	Year of Completion (YYYY)	2007
9	Barrage/ Weir/ Anicut as per Parliamentary Constituency	Tehri Garhwal
10	Seismic Zone	Seismic Zone-IV
11	Length of Barrage & Anicut (m)	81
12	Height upto Crest (m)	39
13	Pond Level (m)	1108
14	Type of Spillway Gate	Vertical Lift
15	No. of Spillway Gates	5
16	Latitude	30°43'35.76"N
17	Longitude	78°26'44.88"E

Salient Features of Maneri Bhali Phase II

	Attribute	Value
1	Hydroelectric Project Name	Maneri Bhali Stage - II Hydroelectric Project
2	State	Uttarakhand
3	Districts	Uttarkashi
4	River	Bhagirathi
5	Basin	Ganga
6	Hydroelectric Region	North HE Region
7	Total Installed Capacity (MW)	304
8	Type of Project	Major (> 25 MW)
9	Hydroelectric Project Status	Completed
10	Purpose	Hydroelectric
11	Owner	State
12	Owner Name	UJVNL
13	Interbasin	No
14	Project Sharing	None
15	Interstate Aggrements	
16	Intercountry	None
17	Latitude	30°36'25.92"N

Salient Features of Tehri Dam

	Attribute	Value
1	Name of Dam	Tehri Dam
2	Dam Name Alias	
3	River	Bhagirathi
4	Nearest City	Pratapnagar
5	District	Tehri Garhwal
6	State	Uttarakhand
7	Basin	Ganga
8	Status	Completed
9	Purpose of Dam	Hydroelectric,Irrigation
10	Year of Commencement (YYYY)	
11	Year of Completion (YYYY)	2005
12	Operating & Maintainance Agency	THDC
13	Dam as per Parliamentary Constituency	Tehri Garhwal
14	Seismic Zone	Seismic Zone-IV
15	Type of Dam	Earthen/ Gravity & Masonry
16	Length of Dam (m)	575
17	Max Height above Foundation (m)	260.5
18		
19	Design Flood (cumec)	15540
20	Type of Spillway	Chute
21	Length of Spillway (m)	592
22	Crest Level of Spillway (m)	815
23	Spillway Capacity (cumec)	13040
24	Type of Spillway Gates	Radial
25	No. of Spillway Gates	3
26	Size of Spillway Gates (m x m)	18 x 14
27	NRLD No.	UA34VH0012
28	Latitude	30°22'41.16"N
29	Longitude	78°28'49.44"E

Salient Features of Koteswar Dam

	Attribute	Value
1	Name of Dam	Koteswar Dam
2	River	Bhagirathi
3	Nearest City	Pratapnagar
4	District	Tehri Garhwal
5	State	Uttarakhand
6	Basin	Ganga
7	Status	Completed
8	Purpose of Dam	Hydroelectric
9	Operating & Maintenance Agency	THDC
10	Dam as per Parliamentary Constituency	Garhwal
11	Seismic Zone	Seismic Zone-IV
12	Type of Dam	Gravity & Masonry
13	Length of Dam (m)	300.5
14	Max Height above Foundation (m)	97.5
15	Total Volume Content of Dam (TCM)	560
16	Design Flood (cumec)	13240
17	Type of Spillway	Ogee
18		
19	Crest Level of Spillway (m)	618.5
20	Spillway Capacity (cumec)	13240
21	Type of Spillway Gates	Radial
22	No. of Spillway Gates	4
23	Size of Spillway Gates (m x m)	18 x 16
24	Remarks	Height- 103.50 m
25	NRLD No.	UA34HH0015
26	Latitude	30°15'37.08"N
27	Longitude	78°29'53.16"E

Salient Features of Vishnuprayag HEP

	Attribute	Value
1	Hydroelectric Project Name	Vishnuprayag Hydroelectric Project
2	State	Uttarakhand
3	Districts	Chamoli
4	River	Alaknanda
5	Basin	Ganga
6	Hydroelectric Region	North HE Region
7	Total Installed Capacity (MW)	400
8	Type of Project	Major (> 25 MW)
9	Hydroelectric Project Status	Completed
10	Purpose	Hydroelectric
11	Owner	Private
12	Owner Name	JPVL
13	Interbasin	No
14	Project Sharing	None
15	Intercountry	None
16	Latitude	30°34'0.84"N
17	Longitude	79°32'48.48"E

Salient Features of Srinagar Dam

	Attribute	Value
1	Hydroelectric Project Name	AHPCL Srinagar
2	State	Uttarakhand
4	Districts	Pauri Garhwal
5	River	Alaknanda
6	Basin	Ganga
7	Hydroelectric Region	North HE Region
8	Total Installed Capacity (MW)	330
9	Type of Project	Major (> 25 MW)
10	Hydroelectric Project Status	Completed
11	Purpose	Hydroelectric
12	Owner	AHPCL
13	Owner Name	AHPCL
14	Latitude	30°13'50.88"N
15	Longitude	78°47'28.32"E

Salient Features of Pashulok Barrage

	Attribute	Value
1	Name of Barrage/ Weir/ Anicut	RishiKesh Barrage
2	Name of Barrage/ Weir/ Anicut Alias	Pashulok Barrage
3	River	Ganga
4	Basin	Ganga
5	Nearest City	Dehra Dun
6	District	Dehradun
7	State	Uttarakhand
8	Status	Completed
9	Year of Completion (YYYY)	1980
10	Barrage/ Weir/ Anicut as per Parliamentary Constituency	Hardwar
11	Seismic Zone	Seismic Zone-IV
12	Length of Barrage & Anicut (m)	312
13	No. of Bays	11
14	Width of Bay (m)	18
15	Crest Level of Spillway (m)	325.5
16	Pond Level (m)	337
17	Design Flood Discharge (cumec)	13200
18	Means for Dissipating Energy (Hydraulic)	Stilling Basin with baffle blocks
19	Sediment Excluding Devices	Silt excluder tunnel
20	Type of Spillway Gate	Vertical Lift
21	No. of Spillway Gates	11
22	Size of Spillway Gates (m x m)	18x8.5
23	No. of Under Sluice Bay	4
24	Size of Under Sluice Bay (m x m)	18
25	No. of Under Sluice Gate	4
26	Width of Head Regulators	11
27	Latitude	30° 4'27.12"N
28	Longitude	78°17'17.88"E

Salient Features of Bhimgoda Barrage

	Attribute	Value
1	Name of Barrage/ Weir/ Anicut	Bhimgoda Barrage
2	River	Ganga
3	Basin	Ganga
4	District	Hardwar
5	State	Uttarakhand
6	Status	Completed
7	Year of Commencement (YYYY)	1982
8	Year of Completion (YYYY)	1986
9	Barrage/ Weir/ Anicut as per Parliamentary Constituency	Hardwar
10	Seismic Zone	Seismic Zone-IV
11	Width of River (m)	675
12	Length of Barrage & Anicut (m)	453.5
13	No. of Bays	15
14	Width of Bay (m)	18
15	Pond Level (m)	293.7
16	Highest Flood Level (m)	296.3
17	Design Flood Discharge (cumec)	193000
18	Means for Dissipating Energy (Hydraulic)	BASIN BLOCKS AND DENTATED SILS
19	Sediment Excluding Devices	SILT EXCLUDER AND SILT EJECTOR
20	Type of Spillway Gate	Vertical Lift
21	No. of Spillway Gates	15
22	Size of Spillway Gates (m x m)	18x7.8
23	No. of Under Sluice Bay	7
24	Size of Under Sluice Bay (m x m)	18
25	No. of Under Sluice Gate	7
26	Size of Under Sluice Gate (m x m)	18x8.4
27	Type of Under Sluice Gate	VL
28	Orientation of Head Regulator with respect to Barrage axis (Angular Unit)	107
30	Maximum Discharge of Canal	164 CUMEC LEFT AND 410 CUMEC RIGHT
31	Latitude	29°57'22.68"N
32	Longitude	78°10'49.44"E

Salient Features of Bijnor Barrage

	Attribute	Value
1	Name of Barrage/ Weir/ Anicut	Madhya Ganga Barrage (Chaudhary Charan Singh Barrage)
2	River	Ganga
3	Basin	Ganga
4	Nearest City	Jansath
5	District	Muzaffarnagar
6	State	Uttar Pradesh
7	Status	Completed
8	Year of Commencement (YYYY)	1978
9	Seismic Zone	Seismic Zone-IV
10	Length of Barrage & Anicut (m)	621
11	No. of Bays	22
12	Width of Bay (m)	18
13	Pond Level (m)	221.8
14	Design Flood Discharge (cumec)	17600
15		
16	No. of Under Sluice Bay	6
17	Size of Under Sluice Bay (m x m)	18
18	Size of Under Sluice Gate (m x m)	18x7.5
19	Latitude	29°22'24.72"N
20	Longitude	78° 2'25.60"E