



SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थं सत्यनिष्ठा
Dedicated to Truth in Public Interest

**Report of the
Comptroller and Auditor General of India
on Implementation of the Namami Gange
Programme by Uttarakhand**



उत्तराखण्ड शासन

**Government of Uttarakhand
Report No. 2 of 2025
(Performance Audit – Civil)**

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Comptroller and Auditor General of India on
Implementation of the Namami Gange
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Preface

This Report of the Comptroller and Auditor General of India for the year ended 31 March 2023 has been prepared for submission to the Governor of the State of Uttarakhand under Article 151(2) of the Constitution of India.

The Report contains the results of the Performance Audit of 'Implementation of the Namami Gange Programme by Uttarakhand', covering the period 2018-23.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Audit wishes to acknowledge the co-operation received from Government of Uttarakhand at each stage of the audit process.

Executive Summary

Executive Summary

About this Report

Rapidly increasing population, rising standards of living and exponential growth of industrialisation and urbanisation have exposed the river Ganga to pollution.

Government intervention for conserving sanctity of Ganga is four decades old. With the objective of controlling the pollution in the river Ganga, the Government of India launched Ganga Action Plan (GAP) Phase-I in 1985 to intercept, divert and treat wastewater generated in 25 class-I towns¹ (cities with population over 1,00,000) in three states: Uttar Pradesh (including Uttarakhand then), Bihar and West Bengal. GAP Phase-II was initiated in 1993 and was later expanded to include some of its tributaries (Yamuna, Damodar and Gomati *etc.*) also. Core schemes of GAP were related to Interception & Diversion and Sewage Treatment Plants (STPs).

The primary focus of GAP was on urban wastewater, but it suffered from various shortcomings of planning and implementation. Comptroller & Auditor General of India has covered the issue of Ganga rejuvenation through three previous Audit Reports (Report No. 5A of 2000, 01 of 2018 and 39 of 2017) which highlighted many issues *viz* Short achievement of primary target of sewage treatment, Shortfall/delays in creation of sewage treatment assets, Faulty designs, Idling of expensive equipment, poor maintenance of sewage infrastructure (Review of the Ganga Action Plan, Report No. 5A of 2000, Union Government, Scientific Departments), lack of adequate capacity to treat sewage, underutilization of STPs, nallas remaining untapped, Municipal garbage remaining dumped on the slopes, non-approval of full plan size by National Mission for Clean Ganga, and Lack of river basin management plan, *etc.* (All India Performance Audit of 'Rejuvenation of River Ganga', Report No. 39 of 2017, Union Government-Ministry of Water Resources, River Development and Ganga Rejuvenation and Performance Audit of 'Rejuvenation of River Ganga', Report No. 1 of 2018, Government of Uttarakhand-Department of Drinking Water).

Establishment of National Ganga River Basin Authority (2009) was another step forward in the direction of cleaning Ganga. Namami Gange was launched as an integrated Ganga conservation mission in the year 2014.

The Performance Audit on 'Implementation of Namami Gange Programme by Uttarakhand' has been carried out during 2023-24, covering the period 2018-23. An attempt has been made in this Report to assess the implementation of this programme at ground level.

Why did we take up this audit again?

River Ganga is inseparably associated with ethos and livelihood of crores of people. Hence, prevention, control and abatement of pollution in river Ganga is a high priority focus area. Over the past four decades, successive governments have made efforts to clean the Ganga, sometimes, under judicial intervention. However, the problem of pollution still persists.

¹ Six in Uttar Pradesh, four in Bihar and 15 in West Bengal.

In this context, Audit has tried to evaluate effectiveness of Namami Gange interventions taken up during 2018-23 for preventing, controlling and abating pollution in river Ganga so that it can be rejuvenated to its pristine condition. This report aims to evaluate, inform, clarify, and disseminate the current achievements of Namami Gange programme in the State. Performance Audit was conducted with the following Audit Objectives:

- Whether Namami Gange infrastructure was adequately planned and performing efficiently to prevent, control and abate pollution in river Ganga;
- Whether projects were implemented in an economic, efficient and effective manner;
- Whether estimation, availability and utilization of funds was adequate and reliable; and
- Whether monitoring and evaluation mechanism was working effectively for realization of the outcomes of projects under Namami Gange.

What has been covered in this audit?

During current Audit, a result-oriented approach has been adopted which assesses whether the programme interventions are performing as planned/intended. The performance audit has covered 23 of 42 projects carried out during 2018-23 and operation and maintenance of earlier assets created under the programme. During evaluation of selected projects, records of State Mission for Clean Ganga, implementing agencies (Uttarakhand Peyjal Nigam, Irrigation Department and Forest Department) and maintenance agencies (Uttarakhand Jal Sansthan, Irrigation and Forest Department *etc.*) were examined.

Endeavour of this audit is to make Government aware of performance of Namami Gange interventions and to help make required course corrections so that programme objectives can be fulfilled in a timebound and more effective manner.

Main Audit Conclusions

Audit found that there is a scope for improvement in planning and implementation of Namami Gange programme as highlighted below:

Chapter-2: Shortcomings in Sewage Treatment Infrastructure

State Ganga Committee and State Mission for Clean Ganga did not plan and implement sewage treatment infrastructure in collaboration with local communities. State Government did not contribute in improving the sewerage facilities in Ganga Front Towns from its own resources. As a result, many STPs either remain unconnected to household sewer network or are only partially connected. Moreover, the existing STPs lack sufficient treatment capacity, resulting in significant discharge of untreated sewage into the Ganga. Uttarakhand Jal Sansthan declined to take over 18 STPs due to deficiencies in their construction and operation. Proper management of sewage sludge was also neglected. Furthermore, the State Ganga Committee did

not conduct timely safety audits of STPs, resulting in avoidable loss of human lives and Namami Gange assets.

Recommendations

1. *The State Government may undertake a comprehensive safety audit of Sewage Treatment Plants to identify and address any potential risks, ensuring that deficiencies are corrected before transferring them to maintenance agencies.*
2. *The State Government may explore the possible avenues of financing sewer networking works and ensure laying of adequate house sewerage networks connecting Sewage Treatment Plants with unconnected households.*
3. *Sufficient co-treatment facilities may be planned and provided to ensure safe disposal of septage in Ganga Front Towns without sewerage network.*
4. *The details of each household and commercial establishment, availability of sewer lines in the area, and status of connectivity of households with available sewer lines may also be considered by implementing agencies while projecting treatment of proposed Sewage Treatment Plants.*
5. *Responsibility may be fixed for: (i) projection of low capacity of Sewage Treatment Plants leading to discharge of untreated sewage into river; and (ii) not ascertaining calorific value of sludge before executing project of Sludge Management Plant.*

Chapter-3: Auxiliary Initiatives for Cleaning Ganga: Solid Waste Management and Forestry Interventions and Ghat & Crematoria

Due to insufficient public awareness through Information, Education, and Communication activities, the crematoria constructed by State Mission for Clean Ganga in various locations remained largely unutilized. The progress of forestry interventions was minimal, with only 16 *per cent* of the planned expenditure implemented. Solid waste management in Ganga Towns suffered from inadequate management practices, as garbage was primarily dumped on river slopes or disposed of through burning instead of proper processing which led to it flowing back into the river.

Recommendations

1. *Initiatives to enhance public awareness about the use of crematoria may be made more effective through Information, Education, and Communication activities.*
2. *Efficient processing and disposal of solid waste may be ensured by all the Urban Local Bodies and regulatory authorization for the same obtained promptly from Uttarakhand Pollution Control Board.*

Chapter-4: Water Quality Monitoring of River Ganga

Audit found that quality of treatment of sewage by STPs was poor. Most of the STPs did not comply with norms of National Green Tribunal or Government of India. The water quality up to Devprayag was A category. In Rishikesh, the water quality of river Ganga remained in B category from 2019 to 2023, with the exception of COVID-19

period (2020 & 2021), when it improved to A category. The river water quality in Haridwar remained consistently in B category throughout the audit period. Uttarakhand Pollution Control Board was not able to get National Accreditation Board for Testing and Calibration Laboratories accreditation for its laboratory which monitors water quality of river Ganga and effluents discharged from STPs. The monitoring of the online continuous effluent monitoring system was inadequate for several reasons like manual data entry of parameters is permitted on the Ganga Tarang Portal, which raises concerns about data accuracy. Additionally, the Ganga Tarang Portal is not accessible to the public, limiting transparency.

Recommendations

- 1. National Accreditation Board for Testing and Calibration Laboratories accreditation for all its laboratories may be ensured by Uttarakhand Pollution Control Board.*
- 2. Shortcomings noticed in Ganga Tarang portal i.e. online continuous effluent monitoring system for Sewage Treatment Plants may be rectified.*
- 3. The issue of Sewage Treatment Plants doing poor quality treatment of water may be taken up by the Department with the respective monitoring agencies & contractors to ensure that Sewage Treatment Plants meet all designated criteria for treated effluent.*

Chapter-5: Financial Management & Procurement of Works

Audit noticed that during the tendering process, the implementing agency relaxed the stringent tertiary treatment standards, established by IIT, Roorkee i.e. faecal coliform of zero MPN per 100 ml was relaxed to 100 MPN per 100 ml, desirable limit as per norms of National Green Tribunal. Accordingly, the contracts were awarded for construction/upgradation of STPs based on the relaxed standards. There were also instances of inadequate recovery of liquidated damages, diversion of funds, non-renewal of bank guarantees, and non-deduction of royalty and labour cess etc.

Recommendation

The State Government may review the instances of non-compliance as highlighted in this chapter and initiate appropriate remedial action.

Chapter-1
Introduction

1.1 Ganga: The Holy River

River Ganga has a very special place in collective consciousness of the people of India. It has provided material, spiritual, religious and cultural sustenance to millions of people since time immemorial.

River Ganga originates as Bhagirathi from the Gangotri glacier at Gomukh in Uttarakhand and joins its tributary Alaknanda in Devprayag to become Ganga. Most of the religious and tourist destinations in Garhwal region of Uttarakhand are alongside Ganga or its tributaries (Figure 1.1). Sixteen main towns of Garhwal region of Uttarakhand *i.e.* Ganga Front Towns¹ are located on the banks of Ganga or its tributaries. Although it covers only 294 kms from Gomukh to Haridwar in Uttarakhand of its course of over 2,525 kms. Municipal sewage and solid waste generated from these towns pose a grave threat to the sanctity of Ganga at the place of its origin itself. This has necessitated Government intervention for conserving the sanctity of river Ganga in Uttarakhand.

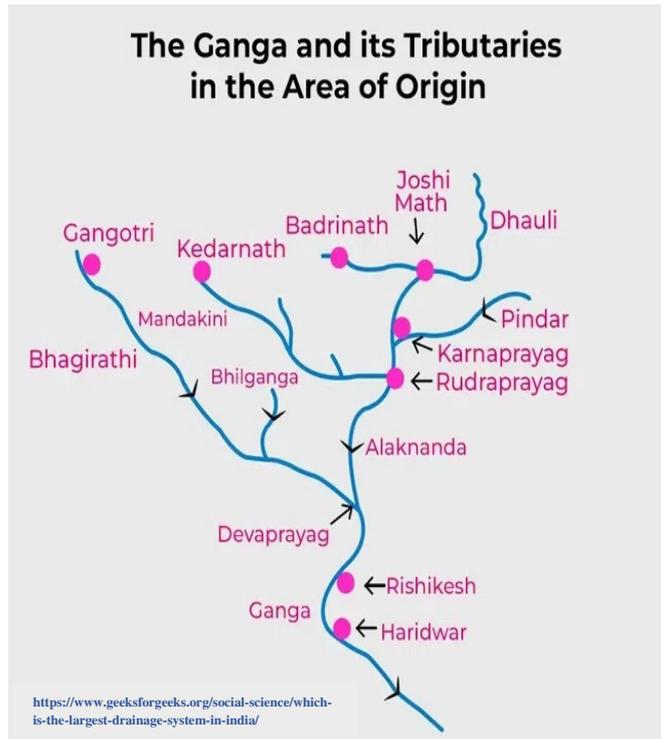


Figure-1.1: The Ganga and its tributaries

1.2 Threats to sanctity of Ganga

Rapidly increasing population, rising standards of living and exponential growth of industrialisation and urbanisation have exposed water resources, in general, and rivers, in particular, to various forms of degradation. The mighty Ganga is no exception. National Mission for Clean Ganga (NMCG), a society constituted under the provisions of the Environment (Protection) Act, 1986 and responsible for implementation of the Namami Gange programme, has classified major polluters of Ganga water into two categories, namely: i) **Point sources**—These are organized sources of pollution where

¹ Gangotri and Uttarkashi-located on the banks of Bhagirathi; Kirtinagar, Srinagar, Rudraprayag, Gaucher, Karnprayag, Nandprayag, Chamoli-Gopeshwar, Joshimath and Badrinath-located on the banks of Alaknanda; and Haridwar, Rishikesh, Muni ki Reti, Tapovan and Devprayag-located on the banks of Ganga.

the pollution load can be measured, *e.g.* surface drains carrying municipal sewage or industrial effluents, sewage pumping stations and sewerage systems, trade effluents from industries, *etc.* ii) **Non-point sources**—These are non-measurable sources of pollution such as run-off from agricultural fields carrying chemicals and fertilizers, run-off from solid waste dumps and areas used for open defecation, dumping of un-burnt/ half-burnt dead bodies and animal carcasses, dhobi ghats, cattle wallowing, *etc.*

1.3 Conservation of River Ganga: Early Initiatives

Government intervention for conserving sanctity of Ganga is four decades old. With the objective of controlling the pollution in the river Ganga, the Government of India (GoI) launched Ganga Action Plan (GAP) Phase-I in 1985 to intercept, divert and treat wastewater generated in 25 class-I towns² (cities with population over 1,00,000) in three states: Uttar Pradesh (including Uttarakhand then), Bihar and West Bengal. GAP Phase-II was initiated in 1993 and was later expanded to include some of its tributaries (Yamuna, Damodar and Gomati *etc.*) also. Core schemes of GAP were related to Interception & Diversion and Sewage Treatment Plants (STPs) which were designed to tackle pollution from point³ sources. Non-core schemes comprised low-cost sanitation schemes, river front development, crematoria *etc.* and tackled non-measurable pollution from non-point⁴ sources, such as dumping of solid waste and open defecation, dumping of unburnt/ half-burnt dead bodies *etc.* Milestones achieved in GAP-I (as on 31 March 2000) and GAP-II (as on 31 March 2014) are as follows in **Table-1.1** below:

Table-1.1: Details of milestones achieved in GAP-I and GAP-II

Programme	No. of Projects Sanctioned	No. of Projects Completed	Funds Released by GoI (₹ in crore)	Expenditure Incurred by States (₹ in crore)
GAP-I	261	260	451.70	433.30
GAP-II	314	264	522.10	505.31

The primary focus of GAP was on urban wastewater, and it suffered from various shortcomings of planning and implementation as highlighted in past audit reports of the Comptroller and Auditor General of India (C&AG) as detailed in **Table-1.2** below:

Table-1.2: Details of past audit reports of C&AG

Name of Audit Report	Audit Period	Main Findings
Review of the Ganga Action Plan (Report No. 5A of 2000, Union Government, Scientific Departments)	1993-2000	Short achievement (39 <i>per cent</i>) of primary target of sewage treatment, shortfall/delays in creation of sewage treatment assets, non-uniformity in determination of sewage characteristics, cost escalations in sanctioned works, faulty designs in Detailed Project Reports (DPRs), lack of necessary spade work, bad contract management, idling of expensive equipment and in general poor maintenance.

² Six in Uttar Pradesh, four in Bihar and 15 in West Bengal.

³ Organized sources of pollution where the pollution load can be measured, *e.g.* surface drains carrying municipal sewage or industrial effluents, sewage pumping stations and sewerage systems, trade effluents from industries, *etc.*

⁴ Non-measurable sources of pollution such as run-off from agricultural fields carrying chemicals and fertilizers, run-off from solid waste dumps and areas used for open defecation, dumping of un-burnt/ half-burnt dead bodies and animal carcasses, dhobi ghats, cattle wallowing, *etc.*

Name of Audit Report	Audit Period	Main Findings
All India Performance Audit of 'Rejuvenation of River Ganga' (Report No. 39 of 2017, Union Government- Ministry of Water Resources, River Development and Ganga Rejuvenation)	2014-17	Lack of river basin management plan, delays in approval of DPRs, non-identification of river conservation zones, delayed execution of projects, poor utilization of rural sanitation funds, shortfall in manpower and poor monitoring of the projects.
Performance Audit of 'Rejuvenation of River Ganga' (Report No. 1 of 2018, Government of Uttarakhand- Department of Drinking Water)	2013-17	Non-approval of full plan size by NMCG (Annual Plan of Operation for Forestry Interventions for Ganga was a meagre 4.66 per cent of the area planned for the year 2016-17 in the Detailed Project Report), funds remaining unspent, municipal garbage remaining dumped on the slopes, underutilization of STPs, nallas remaining untapped, lack of adequate capacity to treat sewage and non-establishment of sufficient number of water quality monitoring stations.

In June 2014, the Government of India launched Namami Gange program with a budget outlay of ₹ 20,000 crore for a period up to 31 March 2021.

1.4 Current efforts for conservation of Ganga: Namami Gange

Namami Gange is an umbrella program aimed at integrating previous and currently ongoing initiatives. The major activities carried out under Namami Gange are rehabilitation of existing STPs, creation of new STPs, development of ghats and crematoria, solid waste management, afforestation and biodiversity conservation *etc.* During 2014-23, a total of ₹ 14,260 crore has been released by NMCG to State Governments (out of which ₹ 1,149 crore was released to Uttarakhand), State Mission for Clean Ganga (SMCG) and other agencies for implementation of projects related to Ganga rejuvenation.

Considering the need and spread of the Programme, Government of India has further approved Namami Gange Mission-II with a budgetary outlay of ₹ 22,500 crore till 2026 *inter alia* including projects for existing liabilities (₹ 11,225 crore) and new projects/interventions (₹ 11,275 crore).

1.5 State level administrative set-up of Namami Gange

Current structures for Governance of Ganga cleaning activities are established by the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 and The Water (Prevention and Control of Pollution) Act, 1974. State level implementation framework for preventing, controlling and abatement of environmental pollution in River Ganga involves seven stakeholders shown in **Table-1.3** below:

Table-1.3: Planning and Implementation Framework of Namami Gange Programme

Stakeholder	Main Responsibilities	Reports to
State Ganga Committee through SMCG	Coordination and implementation of the conservation activities relating to River Ganga including augmentation of sewerage infrastructure, catchment area treatment, creating public awareness at the State level, regulation of activities aimed at the prevention, control and abatement of pollution in the River Ganga to maintain its water quality	NMCG

Stakeholder	Main Responsibilities	Reports to
	and implementation of the river basin management plan. State Ganga Committee acts through its executive wing SMCG.	
District Ganga Committees	Identifying activities which may be threats in the area of specified District abutting the River Ganga and making a plan for remedial action and take remedial action in respect thereof.	State Ganga Committee
Uttarakhand Pollution Control Board (UKPCB)	UKPCB is an independent body functioning under provisions of Section 4 of the Water (Prevention and Control of Pollution) Act, 1974. It monitors water quality of River Ganga and quality of effluents being discharged from STPs constructed under Namami Gange.	Central Pollution Control Board
Urban Local Bodies	Responsible for preventing pollution from Solid Waste Management and safe disposal of corpses in their jurisdiction.	State Government
Village Panchayats	Responsible for preventing pollution into river Ganga and/or its tributaries in their jurisdiction.	
Implementing Agencies	Uttarakhand Peyjal Sansadhan Vikas Evam Nirman Nigam (popularly known as Uttarakhand Peyjal Nigam) is the sole implementing agency for construction of sewerage infrastructure in Ganga Front Towns through its five dedicated field divisions functioning under one Superintending Engineer designated as General Manager-Ganga. The Irrigation Department is an implementing agency for the construction of bathing ghats and crematorium. The Forest Department is responsible for implementing forestry-related interventions.	SMCG and State Government
Maintenance Agencies	Uttarakhand Jal Sansthan is the sole maintenance agency for sewerage infrastructure and Forest Department for forestry related interventions. Bathing ghats and crematoria are maintained by concerned local bodies.	SMCG and State Government

1.6 Why Audit chose the topic again?

Since last four decades, successive governments have made efforts to clean Ganga, sometimes, under judicial intervention. However, the problem of pollution still persists. Since our last performance audit in 2017-18, Audit has noticed deficiencies in planning, implementation and operation & maintenance (O&M) of program activities. As a result, the State Government missed the main milestone of preventing untreated sewage from falling into Ganga. Besides, main audit recommendations like scientific disposal of municipal garbage, capacity upgradation of STPs and tapping of all identified nallas in Ganga Front Towns *etc.* were not implemented by the Government. Still, there were STPs which were not connected to any households. There were various O&M related problems in STPs. New STPs were proposed soon after commissioning of planned STPs. Eighteen out of 44 completed STPs could not be handed over to maintenance agency due to various deficiencies. Single project relating to forestry intervention (plantation) for River Ganga has achieved little physical target (16 *per cent*). The water quality monitoring laboratory of UKPCB still does not have National Accreditation Board for Testing and Calibration Laboratories accreditation. In view of the above problems, Audit selected the issue for Performance Audit.

1.7 Audit Objectives

Performance Audit seeks to examine:

- Whether Namami Gange infrastructure was adequately planned and performing efficiently to prevent, control and abate pollution in river Ganga;
- Whether projects were implemented in an economic, efficient and effective manner;
- Whether estimation, availability and utilization of funds was adequate and reliable; and
- Whether monitoring and evaluation mechanism was working effectively for realization of the outcomes of projects under Namami Gange.

1.8 Audit Scope, Methodology and Sample

A Performance Audit covering the period from 2018-2019 to 2022-23 was carried out during July-December 2023. Audit Universe contained a total of 42 projects related to river Ganga in Uttarakhand (25 of sewage management, 15 of river front development and ghats cleaning, one of afforestation and one of tackling industrial pollution) which were completed, ongoing or under tendering stage during the audit period in Ganga Front Towns. Audit examined 23 out of 42 projects in detail (50 *per cent* of projects from each category subject to the condition that at least one project was selected from each category). Audit selected projects, taking expenditure incurred during 2018-23 as size measure, by Probability Proportional to Size with Replacement method using random number table of National Sample Survey Organization. Besides, O&M of earlier completed assets in selected implementing agencies was also evaluated. During evaluation of 23 selected projects, Audit examined records of SMCG, implementing agencies (Uttarakhand Peyjal Nigam, Irrigation Department, Forest Department and Urban Local Bodies *etc.*) and maintenance agencies (Uttarakhand Jal Sansthan and Forest Department *etc.*).

The audit methodology was mainly consisted of document analysis, responses to questionnaires, examination of reports and records at various levels and field visits to the project sites in selected cases. Audit Scope and Methodology were discussed with Secretary, Drinking Water and Sanitation in an entry conference (04 August 2023). The State Government had furnished its detailed replies on 18 May 2024 to the Draft Report before exit conference, which was conducted with Secretary, Drinking Water & Sanitation along with officers from SMCG and Drinking Water Department on 21 May 2024 wherein the audit findings and recommendations were discussed. Replies of the Government/Department have been suitably included in the Report.

1.9 Audit Criteria

The audit criteria adopted for achieving the audit objectives were derived from the following sources:

- River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016;
- The Water (Prevention and Control of Pollution) Act, 1974;

- Environment Protection Act, 1986;
- Manual on Sewerage and Sewage Treatment Systems, 2013;
- Relevant orders of NGT/High Courts and Supreme Court; and
- General Financial Rules and Uttarakhand Procurement Rules 2017.

1.10 Acknowledgement

Audit acknowledges the cooperation extended by SMCG, District Ganga Committees, Urban Local Bodies, implementing and maintenance agencies (Uttarakhand Jal Nigam, Irrigation Department and Uttarakhand Jal Sansthan) during the audit.

Chapter-2
**Shortcomings in Sewage
Treatment Infrastructure**

Chapter-2

Shortcomings in Sewage Treatment Infrastructure

State Ganga Committee and State Mission for Clean Ganga (SMCG) did not plan and implement sewage treatment infrastructure in collaboration with local communities. State Government did not contribute in improving the sewerage facilities in Ganga Front Towns from its own resources. As a result, many Sewage Treatment Plants (STPs) either remain unconnected to household sewer network or are only partially connected. Moreover, the existing STPs lack sufficient treatment capacity, resulting in significant discharge of untreated sewage into the Ganga. Uttarakhand Jal Sansthan (UJS) declined to take over 18 STPs due to deficiencies in their construction and operation. Proper management of sewage sludge was also neglected. Furthermore, the State Ganga Committee did not conduct timely safety audits of STPs, resulting in avoidable loss of human lives and Namami Gange assets.

2.1 Augmentation of sewerage infrastructure

Prevention, control and abatement of environmental pollution in River Ganga and its tributaries is the prime objective of Namami Gange programme. The programme aims to rejuvenate the river Ganga to its natural and pristine condition. Untreated municipal sewage is considered to be the major source of pollution of rivers. Out of the total measurable pollution in the rivers from various point sources, around 75 per cent is accounted for by municipal sewage from towns located along the banks of rivers. To tackle this menace of pollution from municipal sewage, State Ganga Committees have been entrusted by the Government of India (GoI), through River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, with the duty of augmenting sewerage infrastructure. In Uttarakhand, 78 per cent¹ of the Namami Gange expenditure during 2018-23 was on augmentation of sewerage infrastructure.

2.2 Network of STPs in Ganga front towns

Number and capacity of STPs, constructed under Namami Gange/erstwhile Ganga Action Plan projects, as of May 2024 in 16 Ganga Front Towns is provided in **Table-2.1** below:

Table-2.1: Details of STPs

Sl. No.	Name of Town	Total number of STPs	Total Treating Capacity in million liters per day (MLD)
1	Badrinath	03	1.270
2	Chamoli- Gopeshwar	05	4.370
3	Devprayag	03	1.625
4	Gangotri	01	1.000
5	Haridwar	05	145.000
6	Joshimath	02	3.780
7	Karnaprayag	05	0.350
8	Kirtinagar	02	0.060
9	Nandprayag	02	0.150
10	Rishikesh	03	34.000

¹ (Expenditure on sewage infrastructure: ₹ 680.79 crore) *100/(total expenditure: ₹ 873.17 crore).

Sl. No.	Name of Town	Total number of STPs	Total Treating Capacity in million liters per day (MLD)
11	Tapovan	01	3.5
12	Muni ki Reti	01	7.5
13	Rudraprayag	06	0.525
14	Srinagar	02	4.500
15	Srikot	02	0.125
16	Uttarkashi	01	2.000
	Total	44	209.755

Source: Information collected from SMCG and implementing agencies.

2.3 Planning for augmentation of sewerage infrastructure

Audit noticed following shortcomings in planning for augmentation of sewerage infrastructure in the State:

2.3.1 Lack of State/District level river basin management plan

In 2011, erstwhile State River Conservation Authority (predecessor of State Ganga Committee) had set a target that no untreated urban wastewater and industrial effluent would be allowed to flow into River Ganga by year 2020. SMCG had to prepare a State River Basin Management Plan to achieve this target. Besides, District Ganga Plans were to be prepared for rejuvenation and protection of River Ganga and its tributaries in each village and town of specified District abutting River Ganga and its tributaries.

Audit noticed that SMCG had not prepared state level river basin management plan even after 13 years of its establishment. Despite clear provisions in National Mission for Clean Ganga (NMCG) Authority Order (2016), District Ganga Committees (DGCs) also did not prepare district level river basin management plans in any of the districts through which Ganga and its tributaries flow (Uttarkashi, Tehri, Chamoli, Rudraprayag, Pauri, Dehradun and Haridwar).

The impact of lack of well-defined plans can be seen in fragmented addressing of sewerage problems in Ganga Front Towns, as infrastructure to treat sewage could not develop parallelly and STPs were built but not connected to households, as highlighted in succeeding **Paragraph 2.3.4** and **2.3.5**. Besides, the target of preventing all untreated wastewater from falling into River Ganga by the year 2020 could also not be achieved in absence of concrete planning (**Paragraph 2.4.1**).

The State Government replied (May 2024) that comprehensive district Ganga plan had been prepared for district Udham Singh Nagar only.

The reply is not acceptable in view of the fact that Udham Singh Nagar district does not have any Ganga Front Town in it. Hence, preparing District Ganga Plan in Udham Singh Nagar will have no direct impact on Ganga water quality.

2.3.2 Local public not involved in planning

One of the major themes of Namami Gange Programme is implementation of the concept of Jan Ganga which strives to engage community through various activities. Hence, it was pertinent to engage local population in planning of Namami Gange infrastructure for its sustainability and maintenance.

Audit noticed that State Ganga Committee, SMCG and implementing agencies did not involve the local public in planning Namami Gange infrastructure. Their needs for

sewerage facilities were not heeded by local implementing agencies (*Paragraph 2.3.6* and Social Audit). There were instances when local concerns were met only after public raised the issue of their need through various state authorities, central level ministers and NMCG. For example, an eight MLD STP in Muni Ki Reti (Rishikesh) was sanctioned after Chairman of Nagar Palika Rishikesh raised the issue of low capacity of existing STP with a Central Minister. Similarly, a 1.50 MLD STP at Neelkanth Mahadev Temple was sanctioned after local trade unions, temple management and local MLA pursued the issue of lack of STP facility with Central Minister, State Ganga Committee, Executing Agency *etc.* Findings of social audit commissioned by SMCG revealed that people were dissatisfied with sewerage facilities created under Namami Gange because SMCG had not involved local public in planning and implementation and created improper infrastructure.

Audit noticed that planning of sewerage and other Namami Gange infrastructure without involving local public and without assessing local needs resulted in construction of symbolic sewerage infrastructure (*Paragraph 2.3.4*) and/non-utilization of created infrastructure (*Paragraph 3.2.1*).

Audit noticed that planning of Namami Gange infrastructure was based on top-down approach. For example, 21 STPs², for treating sewage drains, were constructed in compliance of National Green Tribunal (NGT) order dated 10 December 2015. Co-treatment sewerage treatment plants were also planned on the basis of same judgement. Hence, the major planning was based on NGT orders and did not keep the need of the local public (sewerage facilities *i.e.* connecting household sewage with STPs) in perspective.

The State Government replied (May 2024) that local residents were consulted during ground survey for identification of drains, but the consultations were not documented. It added that 8.00 MLD STP in Rishikesh and 1.50 MLD STP in Neelkanth were proposed as per demand of local residents.

The reply is not acceptable because social audit³ commissioned by SMCG itself found that local people were neither consulted nor their needs assessed as mentioned in paragraph. Besides, 8.00 MLD STP in Rishikesh and 1.50 MLD STP in Neelkanth were proposed only after NMCG/GoI intervention.

2.3.3 No financial contribution by State Government in augmentation of sewage facilities for Ganga Rejuvenation

Sanitation is a subject of State List of seventh schedule of the Constitution of India. Hence, providing adequate sanitation and sewerage facilities in all towns of Uttarakhand (be it Ganga Front Towns or others) is the responsibility of State Government, even if there are no centrally sponsored programme, like Namami Gange, in existence.

² Nandprayag- two STPs (Sanctioned in March 2017), Karnaprayag- five STPs (Sanctioned in March 2017), Rudraprayag- six STPs (Sanctioned in March 2017), Kirtinagar- two STPs (Sanctioned in March 2017), Chamoli- one STP (Sanctioned in March 2017), Srinagar- one STPs (Sanctioned in March 2017), Srikot- two STPs (Sanctioned in March 2019) and Joshimath- two STPs (Sanctioned in March 2017).

³ Conducted by Garhwal University, Srinagar, Pauri in year 2022-23.

During audit, it was noticed that the State Government did not allocate funds for enhancing supplemental sewerage facilities in Ganga Front Towns. During 2018-23, State Government spent an amount of ₹ 55.08 crore on creating sanitation infrastructure under State Sector Scheme for Sewage Development. However, no amount was spent in Ganga Front Towns.

Audit noticed that state Government did not construct a single STP or other sanitation infrastructure in any of the 16 Ganga Front Towns using its own resources. It did not provide funds for connecting houses with STPs which were constructed from Namami Gange funds (*Case study of Paragraph 2.3.4*).

During exit conference (May 2024), Secretary stated that State Government had limited financial resources to fulfil its mandate of providing sewage facilities to people irrespective of Namami Gange. With these resources, State Government has prioritized/sanctioned household sewer network in some cities. Currently externally aided KfW⁴ (a German Development Bank) project in Haridwar and Rishikesh are underway that aims at 100 *per cent* coverage of households in these two main Ganga Front Towns. Hence, State Government is moving forward to provide universal sewage facilities in the State.

The fact remains that KfW funded project has only recently commenced and is limited to Rishikesh and Haridwar. Other Ganga Front Towns still lack adequate sewerage facilities.

2.3.4 Construction of 'Symbolic' STPs not connected with households

As per mandate of NMCG, only 'Interception & Diversion (I&D) and STP' works are planned and funded under Namami Gange Programme. I&D works are designed for intercepting drains and diverting them to STP through sewer lines. An I&D network does not include 'house sewer connections and sewer network' which link household to sewer connecting chambers of I&D network. State Government was required to undertake 'house sewer connections and sewer network' through its own resources to fully utilize the STP network.

Audit noticed that sewage treatment projects under Namami Gange were not planned in a comprehensive manner. State Ganga Committee did not ensure that all three components of sewage treatment-STPs, I&D facilities and house sewer connections and sewer network, were planned and implemented simultaneously. Instead, the focus of planning was limited to providing I&D and STP facilities in Ganga Front Towns.

In the above circumstances, the audit noticed that 21 STPs⁵ built in seven towns were not connected to any households, rendering them symbolic in nature. Joint inspection of STPs and scrutiny of records showed that these STPs were treating only grey water (typically generated in kitchens and flowing through roadside drains), rather than actual sewage. The details are in *Appendix-2.1*.

⁴ Kreditanstalt für Wiederaufbau.

⁵ Nandprayag- two STPs, Karnaprayag- five STPs, Rudraprayag- six STPs, Kirtinagar- two STPs, Chamoli- one STP, Srinagar and Srikot- three STPs and Joshimath- two STPs.

Further, most of these 21 STPs cannot handle additional sewage volumes due to their small size (6.04 MLD in total). New STPs will need to be constructed when sewer networks are laid for household connections in future. This approach is evident in Joshimath, where three additional STPs are proposed alongside the sewer network and house sewer connections.

Case Study: Sewage Facilities in Joshimath

In 2010, the GoI sanctioned an I&D scheme to lay 27.67 km of sewer lines at a cost of ₹ 9.61 crore in Joshimath. The scheme included *nalla* tapping but did not provide for STP construction. After facing significant delays, the scheme was closed in March 2017 after exhausting ₹ 9.57 crore, with only 14.64 km of sewer lines laid. Local residents requested house sewer connections to these lines, but this was not possible as the scheme did not include provisions for house connections and STPs.

Again, in March 2017, SMCG got sanctioned from GoI an 'I&D scheme with STP' at a cost of ₹ 48.43 crore for Joshimath. This time, the scheme included two STPs: a 1.08 MLD STP at Pokhari and a 2.70 MLD STP at Marwari. However, it still did not include house sewer connections. The construction of these two STPs was completed in November 2019 and March 2023, respectively, after spending ₹ 33.16 crore. Now, two STPs are functional, nallas are intercepted and diverted to STPs but no house was connected to these STPs due to lack of house sewer connections. NMCG did not provide funds for it because it was not within their mandate. State Government also refused to sanction funds for house sewer connections.

Thus, the infrastructure developed in schemes of 2010 and 2017 with expenditure of ₹ 42.73 crore⁶ did not include sewage connection to any household. After incidents of sinking of land in Joshimath gained limelight and such sinking was attributed to lack of proper sewage system in the town, SMCG submitted (January 2023) a fresh preliminary proposal to NMCG for laying of sewer network and providing house connections at a cost of ₹ 202 crore as per instructions given by NMCG team during their visit (January 2023) to Joshimath.

During exit conference (May 2024), Secretary accepted that lack of sewerage facilities might be one of the reasons for Joshimath incidence. He also informed that a separate Detailed Project Report (DPR) for providing full coverage of sewer connections in Joshimath was under process and funds would be provided by GoI under disaster relief package.

During exit conference (May 2024), Secretary informed that Namami Gange was essentially a drain catching project wherein drains were intercepted and diverted to STPs (I&D with STPs) so that no untreated sewage was discharged to Ganga/tributaries. Provision of simultaneous household connections was not there and Namami Gange has been executed as originally conceived.

⁶ Expenditure against sanction of year 2010: ₹ 9.57 crore + Expenditure against sanction of year 2017: ₹ 33.16 crore.

The reply is not acceptable because the Director General (NMCG), during the fifth meeting of the Executive Council of NMCG in August 2017, underscored the urgent need to resolve the house connection issue. He emphasized that without household connectivity, the STPs could not deliver desired results, rendering the investment of public funds wasteful.

2.3.5 Partial household sewage connectivity

In five big Ganga Front Towns, sewer connectivity was limited to only a fraction of households, except in Haridwar where a bigger population was connected to the STPs. The details of these five towns are given in **Table-2.2** below:

Table-2.2: Details of partial household sewage connectivity in five Ganga Front Towns

Sl. No.	Name of Town	Number of STPs	Total Treating Capacity in MLD	Total no. of Households	Total No. of Sewer connections (Per cent)	Reason of partial connectivity
1	Chamoli-Gopeshwar	04*	4.32	5,510	354 (06.42)	Lack of sewer lines
2	Haridwar	05	145	68,802	47,728 (69.37)	Lack of sewer lines and deficient treatment capacity in STPs
3	Rishikesh including Tapovan and Muni Ki Reti	05	45	34,756	9,966 (28.67)	Lack of sewer lines and deficient treatment capacity in STPs
4	Srinagar	01	3.50	6,523	797 (12.22)	Lack of sewer lines
5	Uttarkashi (Gyansu)	01	2.00	6,089	572 (9.39)	Lack of sewer lines
Total		16	199.82	1,21,680	59,417	

*One STP of 0.05 MLD capacity (near old suspension bridge, Chamoli) has been excluded because it treated only grey water.

Source: Information provided by Directorate of Urban Development, Uttarakhand. Data of Haridwar households has been adopted from the reply of the State Government.

Partial household connectivity with STPs was a major hindrance in Ganga cleanliness. The State Government replied (May 2024) that sewer network and house connections work was under construction in Haridwar and Rishikesh town under KfW loan. Besides, DPR for sewer network in Srinagar and Uttarkashi town was also under preparation.

In comparison to instances of nil/poor connectivity of Namami Gange STPs (as elaborated in **Paragraph 2.3.4 and 2.3.5**), Audit noticed that five MLD STP constructed by Tehri Hydroelectric Development Corporation (THDC) in New Tehri had very impressive household connectivity. This STP of five MLD was commissioned in 2006. It has a sewer network length of 32 km and currently connects 83 per cent of households (3,754 out of 4,543 households) in Tehri. It presents a better model where networking was provided during construction of STP and it makes the STP effective and relevant even after 17 years of its construction.

2.3.6 Unsuccessful planning for co-treatment

State Ganga Committee repeatedly stresses that unconnected households use soak pits and septic tanks as sanitation facility. These on-site sanitation systems require regular

emptying into STPs for appropriate treatment and consequential release. Uttarakhand Government issued (22 May 2017) 'Protocol for Septage Management' in pursuance of NGT directions on the matter.

Paragraph 5.4.1 of the Protocol provides that de-sludging/emptying of septic tanks will be done once every two or three years, or when the tank becomes two third full. Further, paragraph 5.4.3 requires that septage shall be treated in any existing STP within 25 km distance.

Since normal sewer lines and STPs are not designed to treat septage from soak pits and malfunction if septage is included in STPs, SMCG decided (11 November 2019) to set up special co-treatment facilities for treatment of septage combined with the existing STPs of Ganga Front Towns. It instructed Uttarakhand Peyjal Nigam (UJN) to prepare and submit DPRs for co-treatment facility. NMCG provided administrative approval and expenditure sanction (16 June 2022) for ₹ 8.60 crore for a project 'Co-treatment of septage at existing STPs of Haridwar, Rishikesh, Srinagar and Devprayag'. The period of completion of the project was fixed at 12 months.

Audit noticed that the UJN could not succeed in setting up any co-treatment plant in the State and the whole exercise was limited to level of bidding only. Thus, on one hand there was no co-treatment facility available in the state, and on the other maintenance agencies did not allow treatment of septage into existing STPs.

Hence, in absence of proper co-treatment facilities and lack of other options for safe treatment and disposal of septage, the large quantity of septage generated in unconnected households poses a substantial risk of hazardous disposal and of polluting the river system.

During exit conference (May 2024), Secretary, Drinking Water stated that it was not contested that people get their soak pits emptied in open due to lack of sewage coverage of households in STPs. He also informed that bidders were now responding to tendering process of co-treatment facilities. Furthermore, co-treatment facilities had now been made an integral part of all future STPs to be established under AMRUT scheme.

2.3.7 Insufficient projection of treatment capacity

Paragraph 2.2 of Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems highlights need for capacity to treat sewage in short, medium and long term. This requires projection of treatment capacity of STPs keeping in view population forecast using most appropriate method and the density and distribution of such population in several areas, zones or districts. Floating population should also be considered which includes number of persons visiting the project area for tourism, pilgrimage or for working. The numbers should be decided in consultation with the tourism departments and specified for water supply and sewerage (Paragraph 2.6.2 of the Manual).

Audit noticed that implementing agency (UJN) did not possess basic database containing the details of each household and commercial establishment, availability of sewer lines in the area, status of connectivity of households and establishments with available sewer lines. Due to this, sufficient capacity of STPs to be built was not

correctly projected by the implementing agency. Due to this reason, constructed STPs achieved their full capacity in two-three years of their construction as observed in following cases:

Case No. 1: Low Capacity of 68 MLD STP Haridwar

In 2014, implementing agency⁷ proposed a new STP in Jagjeetpur with a capacity of 40 MLD. This proposal was based on the fact that 85 MLD of sewage was reaching to Jagjeetpur against the existing total treatment capacity of 45 MLD⁸ of available two STPs. In 2016, the proposed capacity was enhanced randomly by 10 MLD. Subsequently, an additional 18 MLD was also added to the proposed capacity, as the existing 18 MLD STP, which was commissioned in 1989 was planned to be scrapped. As a result, the total proposed capacity of the new STP was revised to 68 MLD (40 MLD + 10 MLD + 18 MLD). This revised capacity was projected to be sufficient for the sewage load expected by the year 2028.

However, Audit found that the 68 MLD STP was currently having sewage load more than its capacity. In March 2023, the STP was treating daily inlet of 71 MLD sewage at an average. The maximum inlet received in a day was 84 MLD. Hence, the established capacity was exhausted in 2023 itself *i.e.* five years before the schedule of 2028. Though, 18 MLD STP which was planned to be scrapped was still getting sewage of 19-20 MLD per day.

During exit conference (May 2024), General Manager, Construction Circle (Ganga) stated that it was essentially an I&D project which was planned for treating drain discharge only. Secretary, Drinking Water assured that project funded by KfW in Haridwar was based on actual household survey and it would be able to serve all households and floating and camping population.

The reply is not acceptable as the reply highlights a flaw in fundamental planning of assessing the sewage load. Although the STP was approved under I&D project with a planned capacity of 68 MLD to meet projected sewage load by 2028, it was already overloaded by 2023, treating up to 84 MLD in a day. The KfW project is future-oriented and does not address the issue of existing overload.

Case No. 2: Low Capacity of 7.50 MLD STP Dhalwala, Rishikesh

In 2013, NMCG approved the construction of a 7.50 MLD STP in Dhalwala, Rishikesh. However, the project was cancelled in 2016. Subsequently, during 2016-17, another STP of the same capacity was proposed in the DPR projecting that 7.50 MLD of sewage would be generated by 2018. NMCG sanctioned this proposal in March 2017, with a scheduled completion date of August 2019 as per the agreement. However, the projected sewage generation (7.50 MLD in 2018) exceeded the STP's capacity of 7.50 MLD by the time STP was completed (2019), leading to immediate overflow issues. Therefore, the STP was facing problem of overflowing since the beginning.

⁷ Project Manager (PM), Construction & Maintenance Unit (Civil), UJN Ganga Haridwar.

⁸ 18 MLD STP + 27 MLD STP.

The State Government replied (May 2024) that, during rainy season, the quantum of Dhalwala *nalla* exceeds capacity of STP, and excess flow over the capacity of STP is directly discharged into the river.

The reply is not acceptable as the audit noticed that discharge of untreated sewage was not limited to rainy season only and the issue was observed multiple times (January 2023, February 2023 and March 2023, *etc.*) and covered in local print media.

Case No. 3: Low Capacity of five MLD STP Chorpani, Rishikesh

In 2016-17, a STP with a capacity of five MLD was proposed for the Chorpani area in Rishikesh, based on an estimate that five MLD of sewage would be generated by 2028. The same was sanctioned by NMCG in March 2017. The STP was commissioned in November 2020. However, the capacity of STP proved insufficient after it began receiving sewage in excess of its full capacity. Due to rising demand from public and efforts of elected representatives up to NMCG level, a new STP of eight MLD capacity was sanctioned by the NMCG (06 September 2022). Meanwhile, the operator continued discharging excess sewage into river without treatment.

The Central Pollution Control Board (CPCB) team also found 17 MLD sewage coming to the 5.0 MLD STP on their visit to site on 20 June 2023. In response, the contractor responsible for operation and maintenance (O&M) of STP stated (letter dated 28 June 2023) that he was treating sewage as per the capacity of the plant and claimed that he was bypassing the excess sewage as per instructions of UJN *i.e.* the implementing agency.

In addition to the specific instances mentioned, the audit also observed instances of untreated sewage being discharged into the Ganga and its tributaries. Many of these cases stemmed from the inadequate treatment capacity of STPs, as detailed in **Paragraph 2.4.1.**

As the SMCG reviews all DPRs before forwarding them to the NMCG for approval, it bears responsibility for these shortcomings. The responsibility should be fixed against the officials of SMCG, who are responsible for preparation/submission of DPRs to NMCG.

The State Government accepted (May 2024) that flow received at STP was much more than its treatment design capacity and another eight MLD STP was being constructed in the area.

2.3.8 Excess capacity and low intake of sewage

(i) Excess projection of treatment capacity

Availability of surplus capacity to treat sewage may be considered as a sign of STPs being future ready. However, in the case of 1.40 MLD STP Devprayag, Audit noticed that proposed STP operates at only three-four *per cent* of its capacity due to insufficient sewage input.

The 1.40 MLD STP in Devprayag was originally constructed (March 2016) at a cost of ₹ 3.66 crore to serve the entire town, which is divided into three zones. However, the implementing agency, UJN, built two separate STPs⁹ to cater to two of these zones,

⁹ 75 KLD for Shanti Bazar and 150 KLD for Sangam Bazar.

leaving the mentioned STP to handle sewage treatment for only one zone. Currently, this STP receives sewage from 70 households and nine commercial establishments within its designated zone. However, this amount is inadequate to provide the minimum quantity of sewage or greywater required for effective treatment. The STP currently operates at only three - four *per cent* of its capacity due to insufficient sewage input.

Under these circumstances, the Audit observed that there is room for improvement in the quality of sewage treatment. During joint physical inspections, Audit noted visibly dirty and foul-smelling water at the outlets of STPs, as in pictures below:



Photo 2.1 and 2.2: Visibly dirty and smelly water discharged from the outlet of the STP in Ganga

This observation was further substantiated by testing reports from the CPCB on treated effluent, which revealed non-compliance with norms for parameters such as Biochemical Oxygen Demand (BOD), Total Suspended Solid (TSS) and Faecal Coliform (FC) during quarterly tests¹⁰.

The State Government replied (May 2024) that capacity of the STP was proposed to serve the needs of the local residents as well as an extra 7,000 National Hydro-electric Power Corporation personnel who were likely to be employed by THDC. Those personnel were to live in Devprayag. Subsequently, the dam was not constructed and personnel were not shifted to Devprayag.

The reply is not acceptable because THDC manages its own sewage disposal, as evident from construction of five MLD STP in Tehri by THDC (As mentioned in box of **Paragraph 2.3.5**). Furthermore, THDC related claim of Department was not supported by any documentary evidence.

(ii) Vanishing of Incoming Sewage

In Joshimath, a STP with daily treatment capacity of 1.08 MLD sewage was commissioned in September 2019. However, during physical inspection, audit noticed that discharge of the *nalla* (for which the STP was constructed) had diverted somewhere

¹⁰ conducted between August to November 2023 and April to July 2023.

else (perhaps gone underground) resulting in nominal receipt of sewage. STP operator told that the STP received approximately 0.2-million-liter sewage/grey water per month. Audit confirmed that during whole month of October 2023, the STP had received total sewage of less than one million liters. Such little intake of sewage in the STP adversely affected various instruments of the STP. The operator had to decant the STP at least two times a month to keep the STP machinery running. Hence, the whole objective of constructing the STP could not be achieved.

Although flow of drain could be retrieved by repairing the broken sewer line, Audit noticed that no such effort was made by either construction agency or maintenance agency to detect where the discharge had disappeared and there was no possibility to tap household sewer connections without construction of any new networking scheme. Hence, the working of STP was ineffective and it could become useless for future purpose.

The State Government replied (May 2024) that a comprehensive project for sewerage network in Joshimath town was proposed based on Post Disaster Need Assessment Report and the DPR of the project was under preparation.

The Government reply implies that there was no chance of recovering lapsed sewage flow until new works in proposed DPR, which was under preparation, were implemented.

2.3.9 Lack of STP in Ganga front town

Gauchar is a Ganga Front Town with 3,930 households. However, there was no STP in Gauchar and people used soak pits for managing sewage. During physical inspections, Audit was informed that there was high need of STP in Gauchar in view of very high population growth and migration into Gauchar. It was also informed that provisions of septage management¹¹ required cleaning of every soak pit in three years and disposal of that septage into proper STP. However, Audit noticed that no STP was planned and constructed in Gauchar.

When this issue was pointed out by audit, the Implementing Agency stated that as per NMCG norms, only *nalla* tapping (I&D with STP) is done under Namami Gange project. Since there was no *nalla* falling into the river, the proposal for an STP was not made.

This situation highlights the complete dependence of sewage treatment systems in Ganga Front Towns on funding from the Namami Gange initiative.

The State Government replied (May 2024) that a faecal sludge treatment plant had been proposed in December 2023 under Swachhh Bharat Mission programme 2.0.

2.4 Operation and Maintenance of STPs

Proper O&M of STPs is the most significant aspect of efforts for treating municipal sewage and cleaning Ganga. Audit noticed various shortcomings in this function as detailed below:

¹¹ Paragraph 5.4.1 of Septage Management Protocol.

2.4.1 Discharge of untreated sewage into Ganga

Audit carried out joint physical inspections of 37 Namami Gange STPs. During these inspections, Audit noticed that 12 STPs (32 per cent) were discharging untreated sewage into Ganga and its tributaries because of insufficient treating capacity and ineffective tapping of drains/ nallas. The details of such STPs, as noticed during physical inspection, are given in **Table-2.3** below:

Table-2.3: Details of discharge of untreated sewage into Ganga in 12 STPs

Name of STP	Year of Installation	Capacity	Reason of Discharging Untreated Sewage into Ganga
STP Chandreshwar Nagar/ Dhalwala Rishikesh	September 2020	7.50 MLD	Insufficient treating capacity of STP
STP Kirti Nagar	January 2019	10 KLD	Insufficient treating capacity of STP
STP Belni Road, Rudraprayag	November 2020	50 KLD	Destruction of <i>nalla</i> Tapping in Rains
STP Near SBI, Rudraprayag	May 2019	100 KLD	Breaking of <i>nalla</i> Tapping
STP Near bus stand, Rudraprayag	May 2019	75 KLD	Insufficient treating capacity of STP/ Receipt of extra grey water
STP Near Steel Bridge Rudraprayag	September 2019	125 KLD	Insufficient treating capacity of STP
STP, Srikot	February 2021	75 KLD	Insufficient treating capacity of STP
STP, Pokhari Bend, Gopeshwar	August 2020	1.25 MLD	Complete destruction of <i>nalla</i> tapping of Papadiyana <i>nalla</i> during rains which was not repaired by O&M agency
STP (Near old bridge), Karnaprayag	May 2019	100 KLD	Non- tapping of grey water from nearby households
STP (Ward No. 1 and 3), Karnaprayag	April 2019	100 KLD	Leakage from <i>nalla</i> Tapping
STP (Near BRO/New Bridge), Karnaprayag	November 2020	50 KLD	Leakage from <i>nalla</i> Tapping
STP (near police chowki), Karnaprayag	April 2019	50 KLD	Choking of <i>nalla</i> tapping

Source: Physical inspection notes.

In Exit conference (May 2024), the Secretary, Drinking Water assured that sufficiency of treatment capacity of STPs, particularly in hill areas, would be ascertained.

The Government should fulfill its assurance of ascertaining sufficiency of treatment capacity without any delay and fix responsibility of implementing agencies for proposing STPs with low capacity leading to discharge of untreated sewage into Ganga and tributaries.

2.4.2 Willfully discharging of untreated sewage into Ganga by O&M contractor

Section 24 of 'The Water (Prevention and Control of Pollution) Act, 1974' prohibits use of stream or well for disposal of polluting matter like sewer *etc.* Further, as per Section 43, whoever contravenes the provisions of section 24 shall be punishable with imprisonment for a term which shall not be less than one year and six months, but which may extend to six years and with fine.

Operation & Maintenance of two projects at Rishikesh *viz* 3.0 MLD STP, Swargashram and 3.5 MLD STP, Tapovan is being carried out by Executive Engineer, UJS, Ganga, Haridwar. The contractor responsible for maintenance of STPs was found to be

emptying sewage from collection tank of both the STPs directly into Ganga without any treatment which was noticed by Junior Engineer during a surprise inspection of both the STPs on 9 February 2023. Junior Engineer and Assistant Engineer both recommended legal action against the contractor.

The contractor accepted (10 April 2023) his fault and in his defiance stated that the equipment installed in both the STPs were old and defective since the time he had assumed the charge. These challenges were communicated earlier to the maintenance agency many times. He also requested to replace the defective and old equipment installed in STPs, but the maintenance agency never replaced defective equipment for smooth working of STPs. Hence, the Department equally bears responsibility for not taking timely corrective action for replacement/maintenance.

Further, Audit noticed that the department did not pursue any legal action against either the contractor or the responsible officer. Instead, the Superintending Engineer ordered only withholding a part of its payment from O&M bills which could be released later.

During exit conference (May 2024), the Secretary, Drinking Water assured that the Government would fix responsibility for such crime.

2.4.3 Drains discharging into Ganga not tapped

Implementing agency¹², constructed six STPs for tapping of eight drains sanctioned in Rudraprayag. NMCG sanction for the same was provided in March 2017. However, these STPs did not cover all drains and five other drains discharging into Ganga were left. Executive Officer, Nagar Palika Parishad, Rudraprayag requested (11 Dec 2020 and 30 Dec 2020) to District Magistrate, Rudraprayag and District Ganga Committee, Rudraprayag, with copy to implementing agency, to tap the leftover drains which were flowing directly into the river. These drains serve as the carrier of both sewage and solid waste generated from the town, which finally discharged into Alaknanda/Mandakini and ultimately polluted River Ganga.

The State Government replied (May 2024) that implementing agency forwarded (February 2021) the case for tapping of above drains to District Ganga Committee, Rudraprayag for onward submission to SMCG for allotment of funds but the funds were not released yet.

Government reply is not acceptable because implementing agency could not incorporate tapping proposals of all drains when NMCG was approving.

2.4.4 Operation of STPs without renewing authorization and consent from the Uttarakhand Pollution Control Board

Provisions of various Acts and Rules¹³ require STPs to obtain Consolidated Consent and Authorization (CCA) from State Pollution Control Board for operation. The same is renewed from time to time.

¹² PM, Construction and Maintenance Division, Ganga, UJN, Srinagar.

¹³ Section-25 of the Water (Prevention and Control of Pollution) Act, 1974, Section-21 of the Air (Prevention and Control of Pollution) Act, 1981 and Rule 3(c) & 5(5) of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 framed under the Environment Protection Act, 1986.

Audit noticed that eight of 44 Namami Gange STPs were running their operations without renewing CCA from the Uttarakhand Pollution Control Board (UKPCB) for more than four years as of May 2024 (as detailed in **Appendix-2.2**). It was in violation of above provisions and involved the risk of polluting environment due to the absence of any checks in their operations.

The State Government replied (May 2024) that the process of renewal of authorization was in progress by coordinating with UKPCB.

2.4.5 Eighteen STPs not taken over by maintenance agency due to operational and safety related issues

In Uttarakhand, UJN constructs sewerage projects and hands over these systems to UJS, which is the maintenance agency for such assets. A Government order issued in March 2016 reaffirms this directive, specifying that all completed sewerage and water supply schemes must be transferred to UJS within the same financial year of their completion. This ensures smooth operations and effective management of these crucial services.

Audit noticed that 18 out of 44 STPs have not been taken over by the maintenance agency UJS citing construction, operational and safety related deficiencies like overflow of sewage, non-compliance with effluent parameters, unsafe construction *etc.* (as detailed in **Appendix-2.3**). Handover was pending for up to five years.

In absence of handover, a single office¹⁴ was carrying out O&M of these STPs which are spread up to distance of 320 km from Haridwar. This office has time and again expressed its inability to manage the O&M of these STPs. Although the matter pertained to the Namami Gange STPs, SMCG played no role in sorting out the issue. Not transferring of such a large number of STPs points to large scale deficiencies in O&M and construction of facilities.

The State Government replied (May 2024) that steps were being taken to address the defects identified in the 18 STPs mentioned above. They assured that the process of transferring these STPs to the maintenance agency was already underway.

2.5 Management and reuse of sludge

Sewage sludge is a semi-solid or solid waste material that is removed from the sewage during the treatment process at STPs. It contains a variety of contaminants, including heavy metals, pathogens, organic compounds, and micro plastics. Therefore, it must be treated and disposed of safely to prevent any negative impacts on human health and the environment.

2.5.1 Utilization of sludge as organic fertilizers

Sewage sludge in Uttarakhand is freely distributed to farmers for use in agriculture purposes. However, in 13th meeting of Supervisory Committee (28 January 2022), General Manager, Construction Circle (Ganga) highlighted that the sludge generated from the STPs cannot be regarded as ready to use as manure. It was scientifically suggested to undergo further processing of the sludge through composting to enhance its organic properties for application as manure. The same fact was also highlighted in

¹⁴ PM, Mechanical, Construction and Maintenance Unit, Ganga, UJN, Haridwar.

a research paper (Waste to Wealth: Value Addition & Scientific Validation- A Comprehensive Report for Sludge Management in India). The research paper noted that use of untreated sludge as fertilizer on agricultural soil had been shown to increase heavy metal concentrations for areas around Jagjeetpur STP (Haridwar) where sludge from the STP had been used for soil fertilization (Kumar *et al.*, 2022; Pathak *et al.*, 2011; Kumar *et al.*, 2018).

Audit compared parameters of heavy metals available in raw sludge (as noted in the research paper) with standards of city compost (as mentioned in Schedule-IV of Fertilizers Control Order (FCO), 1985) and found that raw sludge was not usable for agriculture purposes. Details are given in **Table-2.4** below:

Table-2.4: Details of heavy metals available in raw sludge

Heavy Metal	Maximum limit as in FCO, 1985 (mg/ Kg)	Quantity available in raw sludge of Jagjeetpur (mg/ Kg)
Arsenic	10	8.11
Cadmium	05	18.51
Chromium	50	77
Copper	300	433
Mercury	0.15	0.69
Nickel	50	76
Lead	100	97
Zinc	1,000	2,730.12

Above data shows that untreated sludge from STPs in Haridwar was not usable in agriculture in light of high quantity of heavy metals.

However, Audit noticed that 64,292 *cubic meters* sludge was produced¹⁵ in three STPs of Haridwar (27 & 18 MLD Jagjeetpur and 18 MLD Sarai) of which 51,071 *cubic meters* was distributed to farmers. This practice, which may harm soil characteristics, was practised in Uttarakhand STPs despite the relevant authorities acknowledging inherent risks.

State Government submitted (May 2024) testing reports of sludge issued by a private laboratory which found parameters of sludge sample to be fit for use as manure for agricultural purposes. Furthermore, in exit conference (May 2024), the General Manager, Construction Circle (Ganga) accepted that the sludge had not undergone treatment and mentioned that a pilot project for its treatment was currently in the planning stages.

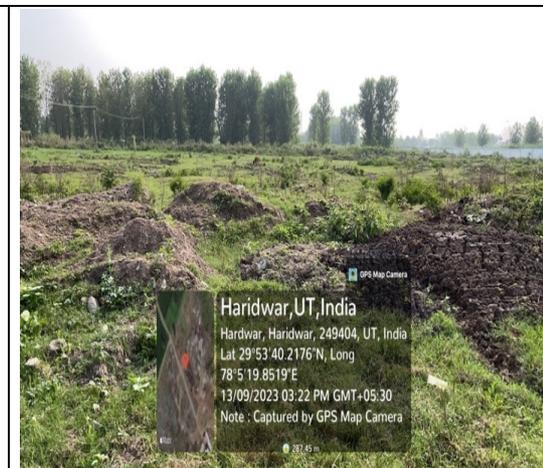
The reply is not acceptable as the Department has already acknowledged unsuitability of untreated sludge as manure and findings of above mentioned independent research papers. Besides, planning of a project for treating sludge is another evidence of the fact that raw sludge should not be used as manure.

2.5.2 Improper storage of sludge

Paragraph 6.11.2.2 of Manual on Sewerage and Sewage Treatment Systems (issued by CPHEEO) provides for use of concrete slabs or other impervious slabs for long term storage of dried sludge. Besides, it is also needed to determine whether the storage facility should be open or covered.

¹⁵ 20 March 2018 to 30 June 2023.

Audit noticed that large amount of sludge was stored in open *kachcha* ground in Haridwar (Sarai ground and Jagjeetpur). However, sludge stored in open ground was prone to get wet and flow to the Ganga during rainy season. Besides, old sludge turned into heaps of soil and its ingredients were prone to seep into ground water and river water.

	
<p>Photo 2.3: Heaps of sludge thrown in 14 MLD Sarai STP (Date: 27 September 2023)</p>	<p>Photo 2.4: Old sludge turned into soil along with fresh sludge (Sarai)</p>
	
<p>Photo 2.5: Dried sludge heaped in open for farmers (Jagjeetpur) (Date: 15 September 2023)</p>	<p>Photo 2.6: Wet sludge spread on open road (Jagjeetpur) (Date: 15 September 2023)</p>

Thus, storage of sludge was not as per norms and could pollute ground and surface water.

During exit conference (May 2024), Secretary, Drinking Water instructed General Manager, Construction Circle (Ganga) to ensure that sludge was not washed out to Ganga/tributaries due to lack of boundary wall *etc.*

2.5.3 Non-operation of sludge management plant

Sludge is also seen as a resource, in terms of generation of energy and production of bio-manures out of it. In view of this, NMCG is currently focusing on reuse of sludge and related bio-products under Namami Gange-II programme.

In line of this, GoI accorded (October 2020) administrative approval and expenditure sanction of ₹ 8.67 crore for construction of a sludge management plant (SMP) in

Rishikesh. Audit noticed that General Manager, Construction Circle (Ganga) selected Thermal Stabilization and Volume Reduction of Sludge technique for the sludge management plant. In this technique, calorific value of sludge is utilized to reduce the volume of sludge by 90 *per cent* and ash is produced which can be used for making paver tiles.

Sludge with calorific value of 4,000 calorie per gram (*cal/g*) produced sufficient heat for drying sludge and reducing volume. If calorific value of sludge was less, additional fuel in the form of Liquefied Petroleum Gas (LPG) was required for running the plant. However, neither General Manager, Construction Circle (Ganga) nor his subordinate *i.e.* Project Manager (PM), E&M, UJN Ganga, Haridwar or contractor assessed the calorific value of sludge produced in STPs and accepted the technology for adoption. Even IIT, Roorkee, that vetted technology, did not highlight the need of testing calorific value of sludge.

The calorific value of sludge was later found as 2,469 *cal/g* which required additional fuel in the form of LPG which was unviable for economic reasons. Due to this reason, the contractor did not run the plant even after commissioning (October 2022) and receiving full payment of ₹ 4.93 crore for construction (construction cost ₹ 4.40 crore plus 12 *per cent* GST). Hence, the objective of constructing SMP remains unfulfilled despite an expenditure of ₹ 4.93 crore.

The State Government accepted (May 2024) the above facts and stated that the plant was not being operated due to contractual dispute regarding who would bear the cost of additional fuel in the form of LPG and the matter was being sorted out in consultation with NMCG. During the exit conference (May 2024), Secretary, Drinking Water assured the audit that he would look into the matter.

2.5.4 Reuse of treated water

NGT has issued instructions from time to time for reuse of treated water. Chief Secretary of Uttarakhand filed a compliance affidavit (31 Dec 2020). He affirmed, with regard to compliance in relation to para 28 (ii) (b) of NGT directions dated 18 Dec 2019, that proposal for reuse of treated water of Sarai STP (Haridwar) and Lakkarghat STP (Rishikesh) was submitted to SMCG (*vide* letter dated 07 July 2020 from Chief Engineer, Planning Section of Irrigation Department) and further to NMCG for sanctioning (estimated costs were ₹ 9.91 crore and ₹ 6.53 crore respectively). However, NMCG, *vide* its letter 12 Oct 2020, rejected the proposals stating that construction of irrigation canal did not come under purview of NMCG. Accordingly, during the Supervisory Committee meeting dated 25 Nov 2020, the Irrigation Department was directed to make its own plan for reuse of wastewater through Scheme of National Bank for Agriculture and Rural Development. However, Audit noticed that there was no progress in this direction and facility to reuse treated water was limited to only three STPs of Jagjeetpur out of total 44 Namami Gange STPs. Besides, there was no progress on reuse of treated water of Sarai STPs (two STPs with cumulative capacity of 32 MLD in Sarai, Haridwar) and 26 MLD STP at Lakkarghat in Rishikesh, as contained in Chief Secretary's affidavit. It led to fall of treated water of the three STPs directly into Ganga.

The State Government accepted (May 2024) that treated water was being used for purpose of irrigation from three STPs in Jagjeetpur only. It also stated that reuse of treated effluent was not feasible in hill areas.

Reply is not acceptable in view of the fact that all these three STPs were fully in plains and there was no progress on reuse of treated water at these two places despite Chief Secretary's commitment before NGT.

2.6 Safety Audit

A safety audit is a systematic review to analyze the risks and hazards in the workplace and evaluate the effectiveness and reliability of the safety procedures set up in the organization. Point no. 9 and 27 of 'River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016' clearly provide that State Ganga Committee and DGCs are responsible for Ganga Safety Audit. In the meeting (May 2022) of Supervisory Committee (constituted under orders of NGT), Executive Director-Technical (NMCG) opined that a safety audit of all the STPs created under Namami Gange was needed to be carried out as a preventive measure for their smooth operation, protection works and other arrangements. Chairman of the supervisory committee issued instructions for the same and it was conveyed (July 2022) to all the concerned by Program Director, SMCG that the report of Safety Audit was to be submitted within 45 days.

Audit noticed that Ganga Safety Audit or safety audit of the STP projects constructed under program was never conducted. DGCs and State Ganga Committee did not take any action in this regard. In the absence of such audit, Audit noticed that two accidents happened which caused loss of property in one case and loss of lives in other case, as detailed below:

Case 1: Loss of property/STP due to landslide

A 75 KLD STP (near Anoop Negi School in Rudraprayag) was constructed (April 2019) on slope of Alaknanda River. It was on a very steep slope and the STP was damaged due to land slide during rains in September 2021. Hence, the STP built at a cost of ₹ 0.88 crore was damaged beyond repair. Its machinery (DG set and other equipment of STP) had to be dismantled and shifted to a safe place. Now, the Department has proposed to shift STP to another location. If safety audit was conducted, loss of this asset could have been avoided.



Photo-2.7: Loss of STP near Anoop Singh Negi School due to landslide

During joint inspections, Audit noticed that 17¹⁶ of total 44 STPs were at risk of physical damage due to being on steep slope/riverbed.

¹⁶ All six STPs in Rudraprayag, all five STPs in Karnaprayag, two STPs in Kirtinagar, two STPs in Devprayag and two STPs in Nandprayag.

The State Government replied (May 2024) that slope stability safety audit of the sites of 26 STPs was being carried out by IIT, Roorkee. The inspection by IIT, Roorkee was expected to be completed by the end of May 2024.

The reply is not acceptable because actions were initiated by the State Ganga Committee and DGCs nearly two years after the Chairman of Supervisory Committee issued orders for safety audits. Regular safety audit could prevent any loss to these assets and resulting loss of human lives.

Case 2: Loss of Human Lives (Electrocution of 28 people in Chamoli STP)

In a grave mishap in 50 KLD STP Chamoli (constructed in September 2019), 28 people were electrocuted on 18 July (one dead) and 19 July 2023 (15 dead and 12 injured). The STP was constructed by PM, Construction & Maintenance Unit, Ganga, UJN, Gopeshwar¹⁷ and handed over to UJS, Gopeshwar in June 2021. This STP was one amongst the 22-steel structure STPs¹⁸ built by implementing agency UJN. These STPs are highly unsafe to electrical hazards due to having steel body structure. After the mishap of electrocution at Chamoli, Office of the Director Electrical safety, Haldwani investigated the incident and departmental action was initiated against the contractor responsible for O&M of the STP. The investigation revealed that there were many defects in the electrical installation of the plant such as non-functionality of safety devices installed in various circuits as per safety and power supply measures, earthing not as per electrical provisions, unsafe joints in incoming cables, temporary wiring *etc.*, which could have been revealed, if safety audit had been conducted.

After this accident, Department conducted an ‘electrical safety inspection’ of STPs. However, the report of this inspection was not provided to the test checked maintenance agencies or Audit. Hence, issues/checklist examined in this electrical safety audit could not be ascertained in audit. Besides, comprehensive safety audit of STPs covering all aspects was still pending.

The State Government replied (May 2024) that electrical safety inspection of all STPs with electro-coagulation technology was conducted after the above accident. During exit conference (May 2024), the Secretary, Drinking Water also assured that report of electrical safety audit would be shared with audit, which however has not been received till date (August 2024).

2.7 Recommendations

- 1. The State Government may undertake a comprehensive safety audit of Sewage Treatment Plants to identify and address any potential risks, ensuring that deficiencies are corrected before transferring them to maintenance agencies.***
- 2. The State Government may explore the possible avenues of financing sewer networking works and ensure laying of adequate house sewerage networks connecting Sewage Treatment Plants with unconnected households.***

¹⁷ PM (Construction & Maintenance Unit) Ganga, UJN, Gopeshwar.

¹⁸ Six STPs in Rudraprayag, five STPs in Karnaprayag, two STPs in Kirtinagar, two STPs in Devprayag, two STPs in Nandprayag and five STPs in Chamoli.

3. *Sufficient co-treatment facilities may be planned and provided to ensure safe disposal of septage in Ganga Front Towns without sewerage network.*
4. *The details of each household and commercial establishment, availability of sewer lines in the area, and status of connectivity of households with available sewer lines may also be considered by implementing agencies while projecting treatment of proposed sewage treatment plants.*
5. *Responsibility may be fixed for: (i) projection of low capacity of Sewage Treatment Plants leading to discharge of untreated sewage into river; and (ii) not ascertaining calorific value of sludge before executing project of Sludge Management Plant.*

Chapter-3

Auxiliary Initiatives for Cleaning Ganga: Solid Waste Management, Forestry Interventions and Ghats & Crematoria

Chapter-3

Auxiliary Initiatives for Cleaning Ganga: Solid Waste Management, Forestry Interventions and Ghats & Crematoria

Due to insufficient public awareness through Information, Education and Communication activities, the crematoria constructed by State Mission for Clean Ganga (SMCG) in various locations remained largely unutilized. The progress of forestry interventions was minimal, with only 16 *per cent* of the planned expenditure implemented. Solid Waste Management (SWM) in Ganga Towns suffered from inadequate management practices, as garbage was primarily dumped on river slopes or disposed of through burning instead of proper processing which led to it flowing back into the river.

3.1 Auxiliary initiatives for cleaning Ganga

Apart from establishing Sewage Treatment Plants for treating municipal sewage, several auxiliary initiatives have been undertaken to mitigate river pollution. These include facilitating proper SWM in Urban Local Bodies (ULBs), constructing ghats and crematoria, and implementing forestry interventions along the Ganga and its tributaries. These supplementary efforts contribute indirectly to reducing pollution in the Ganga.

3.2 Ghats and Crematoria

Bathing ghats and crematoria act as an interface between humans and river. Since ages, riverbanks have been used for offering prayers and cremation of deceased. Development of ghats and crematoria promotes cleanliness of river edges and better infrastructure for social & cultural activities. It also helps prevent disposal of unburnt bodies into river Ganga and helps promote 'People River connect'.

In Uttarakhand, National Mission for Clean Ganga (NMCG) has sanctioned 31 ghats and 28 crematoria at a cost of ₹ 328.59 crore. Audit examined 11 ghats and 15 crematoria with combined expenditure of ₹ 88.62 crore. Following shortcomings were noticed during Audit:

3.2.1 *Unutilised crematoria due to construction without demand and need analysis*

Demand of local public for a project/service is the foremost criteria for expenditure of public money. Local demand ensures full utilization of assets created as well as maintenance of these assets by local people. NMCG found (August 2017) that in many cases, ghats and crematoria were either not need based or over designed. Hence, it instructed SMCG Uttarakhand that while taking up these works, the following points were necessarily adhered to:

- the ghat and crematoria development activities should be taken up considering the requirements of local people and in consultation with local bodies.
- Before commencement of works, SMCG Uttarakhand to consult local bodies and work out proper arrangement for future operation and maintenance (O&M).

- A resolution from the ULB for undertaking O&M beyond project support period should be obtained before commencement of works apart from obtaining all the necessary no objection certificate and clearance.

Despite clear instructions from NMCG, crematoria were constructed without assessing public demand or considering the cultural preferences of the local population. As a result, during joint inspections of 11 crematoria, it was observed that these facilities were neither utilized by local people nor maintained by the local bodies to whom they were transferred.

Status of constructed crematoria are provided in the **Table-3.1** below:

Table-3.1: Status of crematoria as per joint physical inspection

Sl. No.	Place	Whether demand made by local public	Whether Used or Not	If unused, where pyres are burnt	Whether maintained or not	Date of Completion
1.	Cremation Ghat, Chamoli	No	Not used	Pyres are burnt in riverbed	Not maintained	May 2019
2.	Cremation Ghat, Nandprayag	No	Not used	Pyres are burnt in riverbed	Not maintained	January 2019
3.	Cremation Ghat, Karnaprayag	No	Not used	Pyres are burnt in riverbed	Not maintained	March 2019
4.	Crematoria-2, Pokhari Bridge, Karnaprayag	No	Not used	Pyres are burnt in riverbed	Not maintained	March 2019
5.	Gholtir Crematorium, Rudraprayag	No	Not used	Pyres are burnt in riverbed	Not maintained	March 2019
6.	Koteshwar Crematorium, Tehri	No	Not used	Pyres are burnt in riverbed	Not maintained	November 2018
7.	Gauchar Crematorium	No	Not used	Pyres are burnt in riverbed	Not maintained	March 2019
8.	Kedar Crematorium, Uttarkashi	No	Used very less	Some pyres are burnt in riverbed and some in crematorium	Not maintained	February 2019
9.	Heena Crematorium, Uttarkashi	No	Not used	Pyres are burnt in riverbed	Not maintained	February 2019
10.	Dunda Crematorium, Uttarkashi	No	Not used	Pyres are burnt in riverbed	Not maintained	December 2018
11.	Umarnot Cremation Ghat, Karnaprayag	No	Not used	Pyres are burnt in riverbed	Not maintained	January 2019

Following pictures also confirm above facts:



Photo 3.1: Unmaintained and damaged crematorium no. 2, Karnaprayag (Date: 13 Dec 2023)

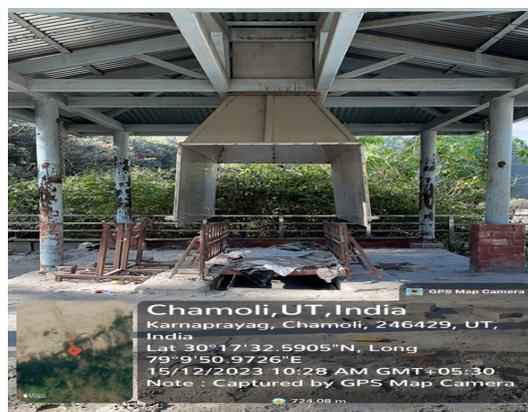


Photo 3.2: Unused and unmaintained crematorium, Gauchar



Photo 3.3: Remnants of a pyre in Riverbed in Gauchar

The State Government acknowledged (May 2024) the above facts and stated that the public was being sensitized by concerned ULBs through Information, Education and Communication activities (May 2024) to use available crematoria and abandon the practice of burning pyres on riverbeds.

3.3 Forestry interventions for River Ganga

Forestry Interventions for Ganga is a sub part of Namami Gange Programme with the objective of sustainable forest management for the benefit of the Ganga River basin. Forest Research Institute, Dehradun has prepared the Detailed Project Report (DPR) for the interventions (mainly plantations) needed to be carried out under entire catchment of river Ganga. The scheme was to be completed during 2016-17 to 2020-21.

During audit of Project Management Unit-Forestry Interventions for GANGA, Forest Department Uttarakhand, Audit noticed following issue in implementation of the scheme:

3.3.1 Meagre progress of forestry interventions

Audit noticed that the approved DPR had planned expenditure of ₹ 885.91 crore for plantation in 54,855.43 hectare¹(Hec) in Uttarakhand during scheme period of 2016-17 to 2020-21. However, Project Management Unit, Forestry Interventions for Ganga Uttarakhand, in consultation with NMCG, proposed very little amounts in Annual Plan of Operations (APOs) each year. This limited expenditure under the scheme to only 16 per cent of originally planned financial targets as detailed in the **Table-3.2** below:

¹ Estimated area as per DPR: Natural Landscape (30,302.50 Hec) +Agriculture Landscape (15,180.00 Hec) + Urban Landscape (1,406.08 Hec) + Conservation Intervention (7,966.85 Hec).

Table-3.2: Details of achievement against target as per approved DPR

(All amounts in crore ₹)

Year	Planned Expenditure as per DPR	APO submitted and approved	Expenditure incurred	Percentage of expenditure vis-à-vis planned expenditure
2016-17	358.91	15.93	15.80	4.40
2017-18	162.57	19.57	19.03	11.71
2018-19	223.97	31.77	30.56	13.64
2019-20	58.70	19.19	16.28	27.73
2020-21	81.76	39.36	36.65	44.83
2021-22	-	26.39	18.38	-
2022-23	-	16.92	7.57	-
Total	885.91	169.13	144.27	16.28

Source: Project Management Unit, Forestry Interventions for Ganga, Forest Department Uttarakhand.

Due to APOs and financial progress being meagre in comparison to the planned expenditure, physical targets were affected very badly. Physical progress under natural landscape (the main component of scheme), agricultural landscape, urban landscape and conservation interventions could be achieved only 34 per cent², 9 per cent³, 6 per cent⁴ and 14 per cent⁵ of planned targets. The scheme could not rise up to expectations of planning done by Forest Research Institute and approved by NMCG.

The State Government accepted (May 2024) that the total funds released by NMCG were far below the targets in the DPR. However, it stated that additional plantation had been planned under CAMPA and other forestry schemes.

The reply is not acceptable as plantations under CAMPA and other forestry schemes have distinct objectives, whereas plantations planned under forestry interventions had specific features tailored for Ganga rejuvenation. Therefore, the shortfall in forestry interventions for Ganga cannot be compensated for by other plantation initiatives.

3.4 Solid Waste Management

Solid waste is swept into water bodies such as the Ganga and her tributaries, either purposely by people or by heavy rains during the monsoon season. In the waters, large amounts of biodegradable waste may take a lot of oxygen from the water to decompose, leading to illness and death of fish and other aquatic creatures, such as the endangered Gangetic dolphin. Non-biodegradable materials float through the rivers, create blocks in the free flow of the water and slowly release their harmful chemicals into the water itself. Aquatic creatures often mistakenly eat these materials and die. Hence, management of solid wastes is very important to tackle the problem of pollution of Ganga. State Ganga Committee monitors status of SWM in its meetings.

SWM Rules, 2016 delineate all arrangements regarding proper management of solid waste in ULBs and census towns. Provisions of Rule 16 of the said Rules makes State

² Natural Landscape: Covered Area:(10,416.70 Hec)/Estimated area as per DPR:(30,302.50 Hec).

³ Agriculture Landscape: Covered Area:(1,412.84 Hec)/Estimated area as per DPR:(15,180.00 Hec).

⁴ Urban Landscape: Covered Area:(90.60 Hec)/Estimated area as per DPR:(1,406.08 Hec).

⁵ Conservation Intervention: Covered Area:(1,128.00 Hec)/Estimated area as per DPR:(7,966.85 Hec).

Pollution Control Board (SPCB) responsible for enforcing these rules through local bodies.

Audit noticed various shortcomings in management of solid waste as highlighted below:

3.4.1 Lack of authorization for processing and disposal of solid waste

Rule 15 of the SWM Rules, 2016 provides that the local authorities and Panchayats shall seek authorisation⁶ from the SPCB for setting up waste processing, treatment or disposal facility, if the volume of waste is exceeding five metric tons per day including sanitary landfills. Rule 16 enjoins the SPCB to grant authorization within a period of 60 days of application stipulating compliance criteria and environmental standards as specified in Schedules I and II of the Rules including other conditions.

During scrutiny of records of Uttarakhand Pollution Control Board (UKPCB), audit noticed that there were 102 ULBs in the State during 2022-23. Out of these, 44 ULBs were producing 5 tons per day or more amount of solid waste. However, none of them were able to get authorization from UKPCB for facilities of processing and disposal of solid waste. Year wise position, since SWM Rules, 2016 coming into effect, is given in **Table-3.3** below:

Table-3.3: Status of authorization from UKPCB for facilities of processing and disposal of solid waste

Year	No. of authorization applications received	No. of authorizations granted
2017-18	06	0
2018-19	24	0
2019-20	18	0
2020-21	08	0
2021-22	20	0
2022-23	02	0

Source: Uttarakhand Pollution Control Board.

UKPCB stated that the proposals were not found fit for granting authorisations. It indicates that management of solid waste was not as per norms established by SWM Rules, 2016. Audit also noticed that State Ganga Committee never enquired about status of authorizations of solid waste disposal facilities despite the fact that they could potentially increase pollution in the river.

The State Government accepted (May 2024) the facts and stated that directions were issued to all ULBs in January 2024 by the Directorate of Urban Development Department regarding the authorization of waste processing and disposal facilities.

The reply is not acceptable because waste processing and disposal facilities continued to operate without proper authorization, even seven years after the rules were implemented, the UKPCB did not fulfill its obligation of ensuring compliance with the SWM Rules.

⁶ Authorisation means the permission given by the SPCB to the operator of a facility or urban local authority, or any other agency responsible for processing and disposal of solid waste.

3.4.2 Ground report of Solid Waste Management

To assess actual position of SWM in Ganga Front Towns, Audit jointly inspected SWM facilities/dumping grounds in 10 hill towns⁷.

Audit observed that solid waste was being indiscriminately dumped on river slopes or disposed of by burning. As a result, all the solid waste either ended up as ashes or was at risk of being washed into the river during rainfall. The following pictures serve as evidence of this issue:

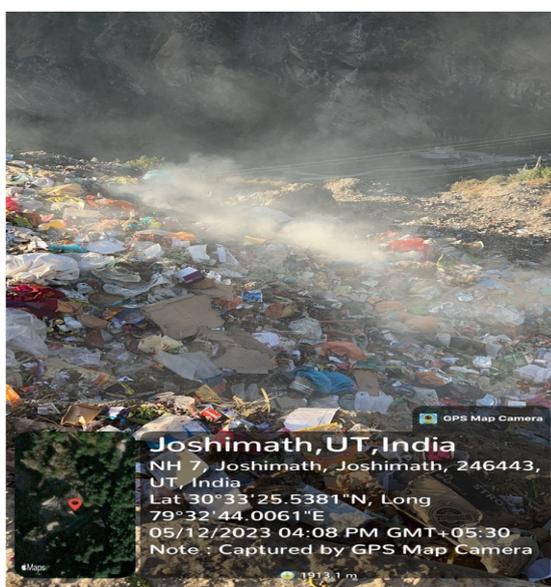


Photo-3.4: Garbage dumped on slope of Alaknanda and being dumped over legacy waste and burnt - Joshimath

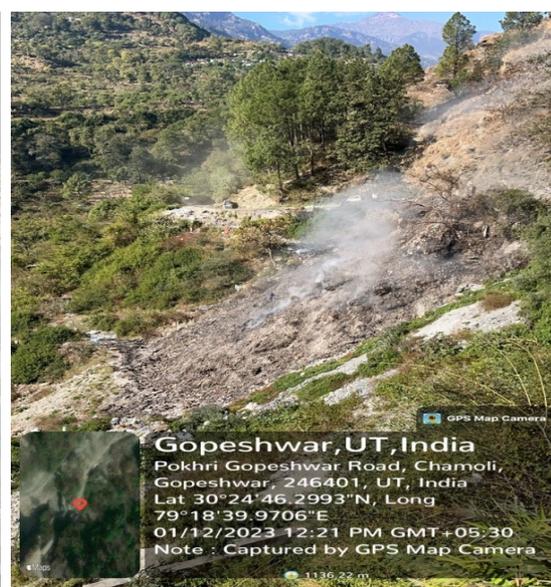


Photo-3.5: Garbage dumped on slope of Balkhila Gadera of Alaknanda and burnt - Chamoli

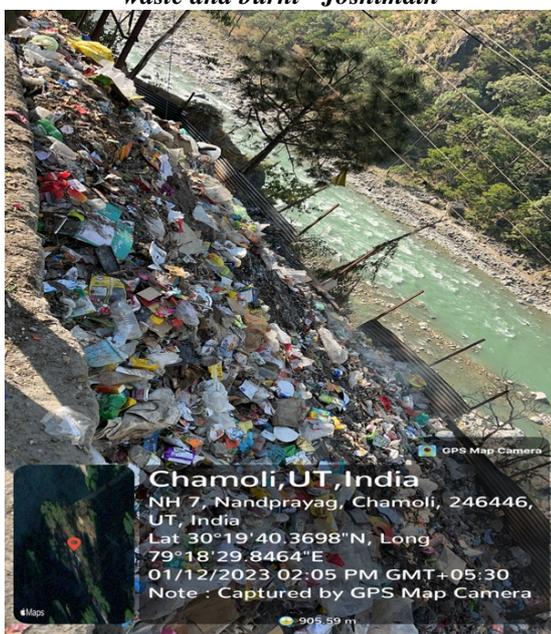


Photo-3.6: Garbage dumped on slope of Alaknanda in Nandprayag

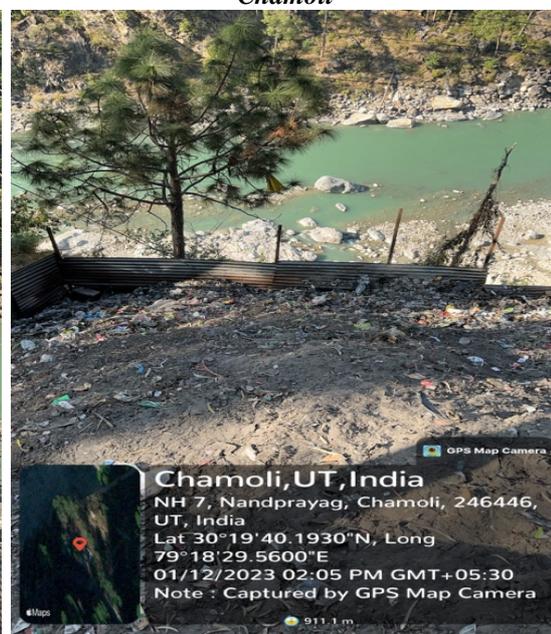


Photo-3.7: Garbage was regularly burnt in Nandprayag dumping ground

⁷ Joshimath, Gopeshwar-Chamoli, Karnaprayag, Nandprayag, Rudraprayag, Srinagar, Tehri, Gauchar, Uttarkashi and Devprayag.

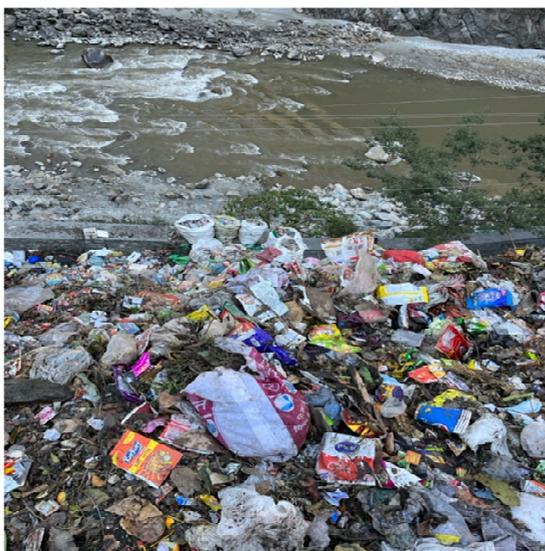


Photo-3.8: Dumping ground in Karnaprayag on bank of Alaknanda (Date:13 Dec 2023)

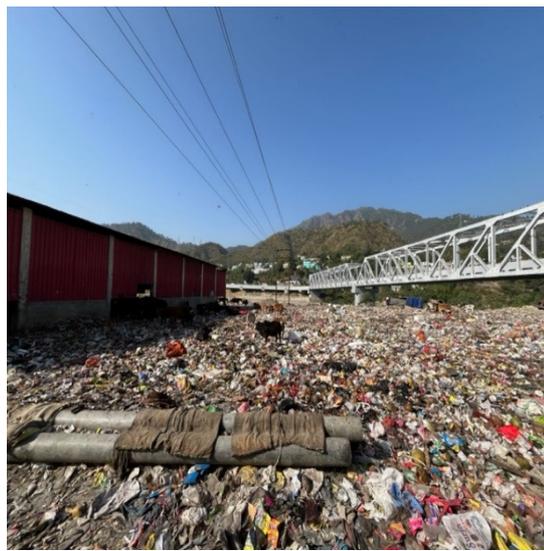


Photo-3.9: Huge dump of garbage on bank of Alaknanda in Srinagar (Date: 5 Nov 2023)



Photo-3.10: Huge dump of garbage on slope of Alaknanda in Rudraprayag

The position, as depicted in above pictures of six towns, was also found in Tehri, Gauchar and Uttarkashi. Devprayag was an exception where solid waste processing facility was located away from river in Kirtinagar.

Therefore, it is evident that most of the solid waste dumping grounds in Ganga towns were situated at inappropriate locations, often near riverbanks. This increased the likelihood of garbage being washed into the river during rainy seasons. Burning of solid waste was also a common practice at these sites. Despite the formulation of SWM Rules seven years ago, the system of SWM remained inadequate. The State Ganga Committee and respective District Ganga Committees did not address the dismal state of solid waste disposal arrangements.

The State Government accepted (May 2024) the facts and confirmed that directives had been issued to all ULBs to prevent fire incidents at legacy waste dumps and manage solid waste effectively. Furthermore, the government has taken action, such as imposing financial penalties, against municipal staff to enforce compliance.

3.5 Recommendations

- 1. Initiatives to enhance public awareness about the use of crematoria may be made more effective through Information, Education and Communication activities.***
- 2. Efficient processing and disposal of solid waste may be ensured by all the Urban Local Bodies and regulatory authorization for the same obtained promptly from Uttarakhand Pollution Control Board.***

Chapter-4
Water Quality Monitoring of
River Ganga

Chapter-4

Water Quality Monitoring of River Ganga

Audit found that quality of treatment of sewage by Sewage Treatment Plants (STPs) was poor. Most of the STPs did not comply with norms of National Green Tribunal (NGT) or Government of India (GoI). The water quality up to Devprayag was A category. In Rishikesh, the water quality of river Ganga remained in B category from 2019 to 2023, with the exception of COVID-19 period (2020 & 2021), when it improved to A category. The river water quality in Haridwar remained consistently in B category throughout the audit period. Uttarakhand Pollution Control Board (UKPCB) was not able to get National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation for its laboratory which monitors water quality of river Ganga and effluents discharged from STPs. The monitoring of the online continuous effluent monitoring system was inadequate for several reasons like- manual data entry of parameters is permitted on the Ganga Tarang Portal, which raises concerns about data accuracy. Additionally, the Ganga Tarang Portal is not accessible to the public, limiting transparency.

4.1 Significant indicators of cleanliness of river water

Quality of river water is measured by the parameters of Total Coliforms, Faecal Coliforms, pH, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand, Total Suspended Solids and Total Dissolved Solids. A brief description of these parameters is provided in **Table-4.1** below:

Table-4.1: Description of water quality parameters

Parameter	Description
Total Coliforms	Total Coliforms counts give a general indication of the sanitary condition of a water supply and it includes bacteria that are found in the soil, in water that has been influenced by surface water, and in human or animal waste.
Faecal Coliforms	Faecal Coliforms are the group of the total coliforms that are considered to be present specifically in the gut and faeces of warm-blooded animals.
pH	pH is a figure between 0 and 14 defining how acidic or basic a body of water is. The lower the number, the more acidic the water is. The higher the number, the more basic it is.
Dissolved Oxygen	Dissolved Oxygen (DO) is the amount of oxygen that is present in water.
Biochemical Oxygen Demand	Biochemical Oxygen Demand (BOD) is the amount of dissolved oxygen needed by bacteria in decomposing the biodegradable organic wastes present in water.
Chemical Oxygen Demand	Chemical Oxygen Demand (COD) measures the amount of oxygen required to oxidise organic (biodegradable and non-biodegradable) and oxidizable inorganic compounds in a water sample.
Total Suspended Solids	Total Suspended Solids (TSS) refer to waterborne particles that exceed two microns in size.
Total Dissolved Solids	Total Dissolved Solids (TDS) refer to any particle that is smaller than two microns.

4.2 Ganga water quality monitoring network

UKPCB monitors the water quality of river Ganga and its tributaries through its eight monitoring locations (Vishnuprayag, Nandprayag, Karnprayag, Rudraprayag, Uttarkashi, Devprayag, Rishikesh and Haridwar) with 33 sampling points. This monitoring is currently carried out under a Namami Gange project named ‘Strengthening of Laboratories’. Audit utilized data of UKPCB to analyse water quality parameters of river Ganga.

4.3 Ganga water quality during audit period

Pollution in river water can generally be gauged through the fact whether it is fit for use in a specific purpose or not. Central Pollution Control Board (CPCB) has classified river water quality into five categories as detailed in *Appendix-4.1*.

Audit examined data of above eight monitoring locations with respect to eight sampling points¹ for four parameters (TC, pH, DO and BOD) relevant for Class A, B and C of water *i.e.* potability of water. The results are shown in **Table-4.2** below:

Table-4.2: Ganga Water quality during audit period

Place (downstream)	Category of Water Quality of Ganga					
	2018	2019	2020	2021	2022	2023
Vishnuprayag	Not measured				A	A
Nandprayag	Not measured				A	A
Karnprayag	Not measured				A	A
Rudraprayag	A	A	A	A	A	A
Uttarkashi	Not measured				A	A
Devprayag	A	A	A	A	A	A
Lakkarghat Rishikesh	Data not available	B	A	A	B	B
Haridwar- Har Ki Pauri	B	B	B	B	B	B

A category - Drinking Water Source without conventional treatment but after disinfection, **B category** - Outdoor bathing (Organised), **C category** - Drinking water source after conventional treatment and disinfection, **D category** - Propagation of Wildlife and Fisheries, and **E category**- Irrigation, Industrial Cooling, Controlled Waste Disposal.

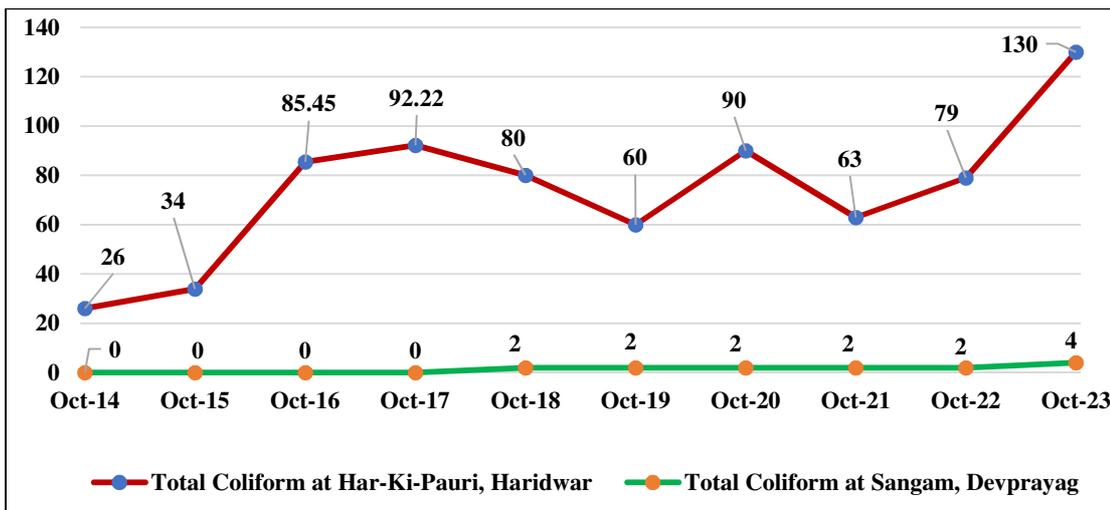
Source: Data provided by UKPCB.

The details indicate that the water quality up to Devprayag is of A category. In Rishikesh, the water quality of river Gange remained in B category from 2019 to 2023, with the exception of COVID-19 period (2020 & 2021), when it improved to A category. The river water quality in Haridwar remained consistently in B category throughout the audit period.

The audit also compared 10-year data of total coliform at Har-ki-Pauri, Haridwar, and Devprayag. It shows that the level of total coliform increased 32 times (as of October 2023) between Devprayag and Haridwar (a distance of 93 km), as depicted in **Chart-4.1** below:

¹ Downstream of above seven monitoring locations and Har Ki Pauri at Haridwar.

Chart-4.1: Comparison of Total Coliform data over the last 10 years at Haridwar and Devprayag



4.4 Quality monitoring of treated effluent of STPs

The CPCB monitors the quality of sewage treatment in STPs on a quarterly basis. It compares the tested parameters of treated sewage against two standards: those notified by the Ministry of Environment, Forest and Climate Change (MoEF&CC), GoI and those set by the NGT. Additionally, the UKPCB monitors the quality of STP discharge according to MoEF&CC norms on a monthly basis.

A comparative summary of both the norms is given in **Table-4.3** below:

Table-4.3: Norms of Treated Discharge of STPs as per MoEF&CC and NGT

Parameter	Limit/ range set by MoEF&CC	Limit/ range set by NGT
pH	6.5-9.0	5.5-9.0
BOD	30mg/l	<10mg/l
TSS	<100mg/l	< 20mg/l
Faecal coliform	<1000MPN/100ml	desirable <100MPN/100ml permissible < 230 MPN/100 ml
COD		< 50mg/l
Nitrogen-Total	Not notified	< 10 mg/l
Phosphorous-Total		< 1.0 mg/l

Audit noticed following shortcomings in the monitoring of STP effluent discharge:

4.4.1 Obsolete monitoring of treated discharge of STPs by UKPCB

Audit found that UKPCB completely overlooked norms set by NGT and evaluated the discharge quality of STPs *vis-à-vis* norms of MoEF&CC which were not accepted by the NGT. Besides, the parameters of COD, Nitrogen-Total and Phosphorous-Total were not even measured. Hence, monitoring of discharge of STPs by UKPCB was obsolete in view of NGT norms.

The Government has stated (May 2024) that the standards of MoEF&CC are still applicable to the STPs because MoEF&CC had preferred (December 2020) to appeal before Supreme Court. Procurement for instruments to measure Total Nitrogen and Phosphorus has been initiated after approval from the competent authority for which tendering process will be initiated and measurement of COD has been started from the month of April 2024.

The Government reply is not acceptable because NGT is a statutory body empowered to pass orders and judgements under the NGT Act, 2010. Its decisions are binding and compulsorily enforceable. Even CPCB, the controlling body of UKPCB, evaluated STPs on both norms *i.e.* NGT norms as well as MoEF&CC norms. Besides, all new STPs in Uttarakhand are constructed in compliance of norms set by NGT. Hence, overlooking NGT norms during evaluation of performance of STPs was not proper.

4.4.2 Poor quality treatment of sewage by STPs

CPCB conducts testing of treated effluents of STPs on quarterly basis. Its testing reports revealed substandard treatment of sewage and non-compliance of norms in most of the 44 STPs. Summary of the latest available quarterly testing reports from CPCB and UKPCB for these 44 STPs located in Ganga front towns is detailed in **Table-4.4** below:

Table-4.4: Compliance Status of STPs according to MoEF&CC and NGT

Period	STPs inspected	Complying with NGT Norms	Not complying with NGT Norms	Complying with MoEF&CC Norms	Not complying with MoEF&CC Norms
Jan-March 2023	44 ²	05 ³	35	12	28
April-July 2023	44 ⁴	05 ⁵	35	09	31
Aug-Nov 2023	44 ⁶	03 ⁷	36	06	33

Source: CPCB quarterly reports of Uttarakhand.

As evident from the above table, the majority of inspected STPs did not comply with NGT norms as well as standards set by MoEF&CC. The level of non-compliance persisted throughout three quarters and was acute as depicted in **Table-4.5 (A)** and **4.5 (B)** below:

Table-4.5 (A): Details of Non-Compliant STPs according to MoEF&CC

Parameter and norm	Range of non-compliance (Number of STPs)		
	Jan-March 2023	April-July 2023	Aug-Nov 2023
BOD < 30mg/l	42-1237 (06)	37-1237 (09)	43-702 (10)
TSS < 100mg/l	113-909 (03)	113-909 (04)	129-354 (02)
COD not mentioned	Not notified	Not notified	Not notified
Faecal coliform: <1000 MPN/100 ml	1700-24 X 10 ¹¹ (28)	2000-13 X 10 ¹¹ (31)	14x10 ² -17 X 10 ⁸ (31)

² Four STPs were Non-Operational during inspection by CPCB: i) Old Suspension bridge STP, Gopeshwar Chamoli, ii) Forest *nalla* STP, Nandprayag, iii) STP Anoop Negi Memorial School, Rudraprayag and iv) Tekla Biodigester STP, Uttarkashi.

³ i) Chamoli Ghat STP, ii) Pokhari Bend STP Chamoli, Pokhari iii) Pokhari 1.08 STP Joshimath, iv) Ward 1&3 STP-05 Karnaprayag and v) one MLD STP near ITI Srinagar.

⁴ Four STPs were Non-Operational during inspection by CPCB: i) Old Suspension bridge STP, Gopeshwar Chamoli, ii) Forest *nalla* STP, Nandprayag, iii) STP Anoop Negi Memorial School, Rudraprayag and iv) Tekla Biodigester STP, Uttarkashi.

⁵ i) Chamoli Ghat STP, ii) Pokhari Bend STP Chamoli, Pokhari, iii) STP Joshimath, iv) Ward 1&3 STP Karnaprayag and v) one MLD STP Srinagar.

⁶ Five STPs were non-Operational during inspection by CPCB: i) Badrinath 0.01 MLD STP, Badrinath ii) Old Suspension Bridge STP, Gopeshwar Chamoli iii) Sangam *nalla* STP, Nandprayag iv) BRO Bridge STP 04 Karnaprayag and v) Tekla STP Uttarkashi.

⁷ i) Badrinath 1.0 MLD, Badrinath ii) Pokhari Bend STP, Chamoli-Gopeshwar iii) Marwari STP, Joshimath.

Table-4.5 (B): Details of Non-Compliant STPs according to NGT Norms

Parameter and norm	Range of non-compliance (Number of STPs)		
	Jan-March 2023	April-July 2023	Aug-Nov 2023
BOD <10mg/l	11-1237 (20)	11-1237 (18)	12-702 (23)
TSS < 20mg/l	21-909 (15)	21-909 (21)	23-354 (14)
COD < 50mg/l	52-1803 (20)	52-1803 (17)	52-1157 (23)
Faecal coliform: desirable <100MPN/ 100ml permissible < 230 MPN/100 ml	450-24 X 10 ¹¹ (31)	450-13 X 10 ¹¹ (34)	680-17 X 10 ⁸ (32)

In the exit conference (May 2024), the Secretary instructed all officials involved to ensure that STPs meet all designated criteria for treated effluent set by MoEF&CC.

4.4.3 Non-accreditation of UKPCB laboratories

The UKPCB operates three laboratories: the Central Laboratory in Dehradun, the Regional Laboratory in Roorkee, and the Regional Laboratory in Kashipur. In June 2018, the National Mission for Clean Ganga (NMCG) sanctioned a project for 'Strengthening of Laboratories of UKPCB' at an estimated cost of ₹ 16.21 crore. The duration of the project was set for five years from the date of the sanction order. The laboratories were required to achieve NABL accreditation within a specified timeframe to ensure the quality assessment and control of the monitored data. NABL accreditation enhances confidence in the testing and calibration reports issued by the laboratories, emphasizing accuracy and reliability.

Examination of UKPCB records revealed that it utilized only ₹ 5.55 crore (34 per cent of the sanctioned amount by NMCG) over the five-year period for operating its laboratories. Despite being a regulatory body, UKPCB did not apply for NABL accreditation for its laboratories during the project period. After the expiration of the original project period, UKPCB applied for NABL accreditation for its Central Laboratory in September 2023, but it had not yet been awarded. In the absence of the required accreditation, the results of testing conducted by UKPCB lacked the reliability that an accredited laboratory could ensure.

The Government replied (May 2024) that NABL accreditation for central laboratory of UKPCB was currently underway, with the final assessment scheduled for June 2024.

Reply confirms that UKPCB could not obtain NABL accreditation in scheduled target time for all its laboratories, even after six years of sanction.

4.4.4 UKPCB testing was not reliable

Audit observed significant discrepancies between the test results from the UKPCB laboratory and those from the CPCB laboratory. This discrepancy was evident in the testing results of the 68 mld STP at Jagjeetpur, Haridwar (the largest STP in the state) conducted in March 2023, May 2023, and October 2023. During these periods, both CPCB and UKPCB tested the treated effluent from the 68 mld STP, and the results are shown in **Table-4.6** below:

Table-4.6: Test results for 68 MLD STP according to UKPCB and CPCB

Parameter	UKPCB March 2023	CPCB March 2023	UKPCB May 2023	CPCB May 2023	UKPCB October 2023	CPCB October 2023
BOD	10	03	6.4	8	9.6	4
TSS	08	<i>below detection limit</i>	07	25	10	<i>below detection limit</i>
Faecal coliform	58	14 X 10 ³	58	17 X 10 ³	170	39 X 10 ³

From above table, we can see that test results of all parameters (BOD, TSS and faecal coliform) were different in UKPCB and CPCB testing. Similar discrepancies were observed in the test results for other STPs as well.

In the exit conference (May 2024), UKPCB official stated that variations in the results of samples of treated effluents tested by UKPCB and CPCB might be due to differences in sampling methods and the timing of sample collection.

The reply is not acceptable because, although STP discharge results can vary daily, the significant discrepancies between the results from the CPCB laboratory and those from the UKPCB laboratory raise questions on efficacy of UKPCB testing.

4.5 Online continuous effluent monitoring system

Ganga Tarang web portal has been deployed by NMCG as an Online Continuous Effluent Monitoring System (OCEMS) which records parameters of treated sewage being discharged from STPs. State Mission for Clean Ganga (SMCG) and implementing agencies utilize it for monitoring and manual data entry respectively.

Audit noticed following shortcomings in functioning of that portal:

- Manual data entry of parameters is also allowed in Ganga Tarang Portal. However, there was no system through which SMCG could check authenticity of such manual data entry by STP operators;
- Ganga Tarang is not open for access to general public. It requires departmental ID/password and does not show any data without ID/password. Hence, it could not achieve the objective of connecting common people with the affairs of Ganga cleanliness through STPs;
- During audit of selected O&M agencies and physical inspection of STPs, records of calibration of OCEMS components were not provided to Audit. At SMCG too, there was no record containing details of such calibration. Hence, calibration of OCEMS components was not ensured.

Thus, OCEMS was not functioning in a proper manner. Audit noticed that the State Government/SMCG did not take any initiative with NMCG to get the portal developed in such a way which could have enabled the respective authority to verify the authenticity of the manual data entered by the STP operators which was a critical gap that needed to be addressed.

The State Government replied (May 2024) that as per recommendations of Audit, SMCG, Uttarakhand could seek approval of NMCG to offer the access to Ganga Tarang portal to general public. Regarding manual data entry, it was stated that manual data entry was allowed to integrate offline STPs (which do not have OCEMS), so that data of general parameters of these STPs could be fed into Ganga Tarang portal.

4.6 Recommendations

- 1. National Accreditation Board for Testing and Calibration Laboratories accreditation for all its laboratories may be ensured by Uttarakhand Pollution Control Board.**
- 2. Shortcomings noticed in Ganga Tarang portal i.e. online continuous effluent monitoring system for Sewage Treatment Plants may be rectified.**
- 3. The issue of Sewage Treatment Plants doing poor quality treatment of water may be taken up by the Department with the respective monitoring agencies & contractors to ensure that sewage treatment plants meet all designated criteria for treated effluent.**

Chapter-5
Financial Management &
Procurement of Works

Chapter-5

Financial Management & Procurement of Works

Audit noticed that during the tendering process, the implementing agency relaxed the stringent tertiary treatment standards, established by IIT, Roorkee *i.e.* faecal coliform of zero MPN per 100 ml was relaxed to 100 MPN per 100 ml, desirable limit as per norms of National Green Tribunal (NGT). Accordingly, the contracts were awarded for construction/upgradation of Sewage Treatment Plants (STPs) based on the relaxed standards. There were also instances of inadequate recovery of liquidated damages, diversion of funds, non-renewal of bank guarantees, and non-deduction of royalty and labour cess *etc.*

5.1 Availability and Utilisation of funds

Namami Gange is a 100 *per cent* centrally funded scheme. The National Mission for Clean Ganga (NMCG), a society constituted under the provisions of the Environment (Protection) Act, 1986 and responsible for implementation of the Namami Gange programme, releases funds to the State Mission for Clean Ganga (SMCG) on a lump sum basis for the projects¹ approved by it. For earlier projects related to National Ganga River Basin Authority State share includes establishment cost (in a 70:30 sharing pattern) as well as land cost released by State Govt. For forestry interventions, funds are provided to Forest Department. During the period from 2018-19 to 2022-23, the status of availability and utilisation of funds under various components is given in **Table-5.1** below:

Table-5.1: Availability and Utilisation of funds

(₹ in crore)

Year	Opening balance	Funds received during the year				Total funds available	Funds utilized	Funds returned to NMCG	Unspent balance
		Central share	State Share for establishment cost	Interest and others	Total				
1	2	3	4	5	6=3+4+5	7=2+6	8	9	10=7-(8+9)
2018-19	79.46	320.57	5.50	1.90	327.97	407.43	378.06	0.13	29.24
2019-20	29.24	104.31	0.30	0.97	105.58	134.82	108.35	0.12	26.35
2020-21	26.35	126.83	1.27	1.39	129.49	155.84	133.51	0.32	22.01
2021-22	22.01	153.16	0.62	2.21	155.99	178.00	158.81	5.50	13.69
2022-23	13.69	90.00	5.25	0.95	96.20	109.89	94.44	15.27	0.18
Total		794.87	12.94	7.42	815.23	985.98	873.17	21.34	

Source: SMCG, Project Management Unit and PD, Forestry Interventions for Ganga Namami Gange.

Audit noticed following shortcomings in management of Namami Gange funds:

5.1.1 Parking of fund by Implementing Agencies

As per Rule 230 (8) of General Financial Rules 2017, all interests, or other earnings against Grants in aid or advances (other than reimbursement) released to any Grantee

¹ Projects related to Interception & Diversion and construction of STPs and River Front Development (Construction of Bathing Ghat and Crematoria).

institution should be mandatorily remitted to the Consolidated Funds of India (CFI) immediately after finalization of the accounts. NMCG requested (December 2020, January 2021 and April 2022) SMCG to surrender the bank interest amount to NMCG at the earliest for deposit into the CFI. SMCG issued (February 2020, August 2021 and November 2021) instructions to all Implementing Agencies (IAs) that once projects are completed and handed over to maintenance agencies, unspent bank balances along with interest lying in their bank accounts were to be surrendered to SMCG for onward surrender to NMCG for deposit into the CFI.

Audit noticed that IAs did not surrender unspent balance of ₹ 1.92 crore² and bank interest amounting to ₹ 0.59 crore³ to SMCG and parked the same in division's bank account. It was in violation of above mentioned rules.

The State Government replied (May 2024) that it had instructed all agencies to promptly return any unused funds, including accrued bank interest. Upon receipt of these funds from the respective executing agencies, the same would be surrendered to NMCG.

5.2 Issues related to Tertiary Treatment Process

Tertiary treatment of wastewater is the third stage (after secondary treatment) of the wastewater treatment and is also known as an advanced treatment⁴. As per the conditions outlined in the Administrative Approval and Expenditure Sanction (AA&ES) provided by NMCG for tertiary treatment projects:

1. The bid document must be technology neutral. Bidders should have the flexibility to choose any suitable technology, provided it achieves the desired treatment outcomes.
2. All conditions recommended by the Appraisal Agency (IIT, Roorkee) in their appraisal report must be adhered to by the State Government and Pey Jal Nigam.

The outcome parameters of water quality of tertiary treated effluent were set by IIT, Roorkee during appraisal of project Detailed Project Reports (DPRs).

² PM, UJN, Ganga Rishikesh: ₹ 0.39 crore; PM, UJN, Ganga Srinagar: ₹ 0.09 crore; EE, ID, Haridwar: ₹ 0.05 crore; EE, ID, New Tehri: ₹ 0.02 crore; EE, ID, Srinagar: ₹ 0.02 crore; EE, ID, Uttarkashi: ₹ 0.96 crore and UPDCC: ₹ 0.39 crore (Total: ₹ 1.92 crore).

³ PM (Mech), UJN, Ganga Haridwar: ₹ 0.07 crore; PM, UJN, Ganga, Haridwar: ₹ 0.03 crore; PM, UJN, Ganga, Srinagar: ₹ 0.03 crore; PM, UJN, Ganga, Gopeshwar: ₹ 0.06 crore; EE, MD, UJS, Ganga, Haridwar: ₹ 0.08 crore; EE, MD, UJS, Devprayag: ₹ 0.01 crore; EE, MD, UJS, Rudraprayag: ₹ 0.0005 crore; EE, MD, UJS, Pauri: ₹ 0.004 crore; EE, MD, UJS, Karnaprayag: ₹ 0.0009 crore; EE, MD, UJS, Gopeshwar: ₹ 0.01 crore; EE, ID, Haridwar: ₹ 0.02 crore; EE, ID, Srinagar: ₹ 0.11 crore; UPDCC: ₹ 0.03 crore and UKPCB: ₹ 0.13 crore (Total: ₹ 0.59 crore).

⁴ Tertiary treatment includes processes like filtration, ion exchange, activated carbon absorption, electro dialysis, nitrification, and denitrification.

In Haridwar, two STPs (68 MLD STP Jagjeetpur and 14 MLD STP Sarai) were planned to be established as tertiary treatment STPs. Besides, two more STPs (27 MLD Jagjeetpur and 18 MLD Sarai) have been upgraded to tertiary treatment level by installing additional equipment/plant. The details of these STPs are given in **Table-5.2** below:

Table-5.2: Details of STPs planned for Tertiary Treatment Plant

Place	Capacity	Commissioning Year	Treatment Status
Jagjeetpur	27 MLD	2009	Upgraded to Tertiary Treatment Plant (TTP) in 2017
	68 MLD	2020	Approved for establishment as TTP, currently operates with secondary treatment
Sarai	14 MLD	2020	Approved for establishment as TTP, currently operates with secondary treatment
	18 MLD	2014	Upgraded to TTP in 2017

Audit noticed following irregularities regarding establishment and upgradation of tertiary treatment STPs.

5.2.1 Establishment of Secondary Treatment STPs under the name of Tertiary Treatment Plants

In 2016, the implementation agency Uttarakhand Jal Nigam⁵ (UJN) prepared a proposal to establish a 68 MLD STP in Jagjeetpur and a 14 MLD STP in Sarai, both with tertiary treatment standards. The project's DPRs were vetted by IIT, Roorkee (November and December 2016). IIT, Roorkee established stringent norms for tertiary treatment, including a faecal coliform standard of zero MPN per 100 ml, which was 230 MPN per 100 ml in the DPRs, permissible limit as per norms of NGT. The DPRs with stringent norms, were subsequently approved by NMCG in March 2017.

Audit noticed that during the tendering process, the implementing agency relaxed the tertiary treatment standards, for instance, the faecal coliform requirement was relaxed to 100 MPN per 100 ml, desirable limit as per norms of NGT. Accordingly, the contract was awarded (October 2017) for construction of two STPs based on the relaxed norms of 100 MPN per 100 ml.

It was further noticed during audit that current performance of these STPs falls short of even the relaxed secondary treatment norms specified in the agreement, as given in **Table-5.3** below:

Table-5.3: Performance of STPs

Parameter	Tertiary Treatment Norm as per IIT	Secondary Treatment Norms (Agreement with Contractor)	Performance of 68 MLD STP	Performance of 14 MLD STP
TSS	5 mg/L	≤10 mg/L	25	14
Faecal Coliform	0 MPN/ 100 ML	≤100 MPN/ 100 ML	17 X 10 ³	22 X 10 ³

Note: Performance of STPs has been taken from CPCB testing report April- July 2023.

⁵ PM, Construction and Maintenance Division, UJN, Ganga, Haridwar.

The State Government replied (May 2024) that both the STPs were constructed for achieving the treatment standards as specified in DPR and as per NGT norms.

The reply is not acceptable because the faecal coliform standard of Zero MPN per 100 ml, as specified by IIT, Roorkee was not followed during construction of these STPs.

5.2.2 Upgradation of STPs to Tertiary Treatment Plants

The implementation agency Uttarakhand Jal Nigam submitted a proposal in May 2016 for upgradation of existing 27 MLD STP (Jagjeetpur) and 18 MLD STP (Sarai) to Tertiary Treatment Plants. The project's DPR, vetted by IIT, Roorkee, (November 2016) set stringent norms for tertiary treatment, including a faecal coliform standard of zero MPN per 100 ml, which was 100 MPN per 100 ml in the DPRs, desirable limit as per norms of NGT. The DPRs with stringent norms were subsequently approved by NMCG in March 2017.

Audit noticed that during the tendering process, the implementing agency continued with the faecal coliform norm of 100 MPN per 100 ml and accordingly awarded the contract (October 2017) for upgradation of two STPs.

Further, in its proposal, the implementation agency had cited Nilothi STP in Delhi as a model for upgrading the STPs in Haridwar to tertiary treatment. The Nilothi STP operates on tertiary treatment and was found to achieve a faecal coliform level of zero MPN per 100 ml during NGT inspection. Despite this, the stringent tertiary norms set by IIT, Roorkee were disregarded and relaxed during the tendering stage.

The State Government replied (May 2024) that performance was relaxed in the bid document as per then prevailing NGT norms.

The reply is not acceptable because the faecal coliform standard of zero MPN per 100 ml, as specified by IIT, Roorkee was not followed during upgradation of these STPs.

5.3 Non-operation of master control station

A Master Control Station (MCS) was built for real-time monitoring of the 18 Sewerage Pumping Station in Haridwar at a cost of ₹ 0.40 crore by Project Manager, UJN, Haridwar and handed over to Uttarakhand Jal Sanathan (UJS), Haridwar. During audit, it was found that the MCS was not operational since January 2022. Executive Engineer (UJS-Ganga), Haridwar informed that it was not operated due to insufficient manpower and paucity of funds. Hence, due to non-operation of MCS, all 18 Sewerage Pumping Stations in Haridwar remained unmonitored by technology in this period.

The State Government accepted the above facts (May 2024) and stated that MCS was not running due to shortage of skilled software engineer. Now trained person has been deployed and MCS system is operational and all Sewerage Pumping Station are being monitored by MCS.

5.4 Commencement of work before obtaining technical approval from competent authority

Para 318 of Financial Handbook Volume VI explicitly provides for obtaining technical sanction from competent authority before work is commenced.

Audit noticed that ghat/crematoria development works were executed by six Irrigation divisions⁶ under Namami Gange program during the audit period. Out of six divisions, four divisions commenced the Construction works before getting technical sanction from competent authority (as detailed in *Appendix-5.1*).

The State Government replied (May 2024) that due to importance and urgency of work and upcoming monsoon, tenders of some works were invited, and work was started in the anticipation of the technical sanction from the competent authority. It further added that technical sanction was obtained from the competent authority at initial stage of the works.

The reply is not acceptable due to the significant delay in obtaining technical sanction for all works, which extended from one month to eight months. Moreover, compliance with the applicable rules regarding technical sanction was also neglected.

5.5 Excess expenditure on project preparation and supervision charges

The extent guidelines for Namami Gange Programme provide that a maximum of four *per cent* of basic capital cost as per AA&ES is admissible towards each DPR preparation and project supervision. If the agreement cost is lower than the AA&ES cost, the four *per cent* limit will be applicable on the agreement cost. Expenses on each project preparation and project supervision will be limited to the four *per cent* of lower of AA&ES/agreement cost.

Audit noticed that three Project Managers of Peyjal Nigam (Ganga divisions) incurred expenditure of ₹ 1.83 crore (₹ 1.05 crore⁷ on project preparation and ₹ 0.78 crore⁸ on supervision charges) in excess of above ceiling from project funds which was in violation of instructions of the NMCG. This excess expenditure was due to all actual expenditure on project preparation and supervision charges being borne on project funds. Details of excess expenditure are given in **Table-5.4** below:

Table-5.4: Excess expenditure on project preparation and supervision charges

(₹ in lakh)

Implementing Agency	Project	Sanctioned capital cost	Agreed capital cost	As per provision		Actual expenditure		Excess expenditure	
				PP@4%	PS @4%	PP	PS	PP	PS
UJN, Haridwar	14 MLD STP Sarai	2,315.42	4,140.00	92.62	92.62	128.86	151.45	36.24	58.83
	68 MLD STP Jagjeetpur	10,209.42	9,930.00	397.20	397.20	444.63	-	47.43	-
Total								83.67	58.83

⁶ EE, ID, Haridwar, Rudraprayag, Tehri, Tharali, Srinagar and Uttarkashi.

⁷ Project preparation [PM, UJN, Haridwar: ₹ 0.84 crore {₹ 0.36 crore + ₹ 0.48 crore} + PM, UJN, Srinagar: ₹ 0.15 crore and PM, UJN, Chamoli: ₹ 0.06 crore] (Total: ₹ 1.05 crore).

⁸ Project supervision (PM, UJN, Haridwar: ₹ 0.59 crore + PM, UJN, Chamoli: ₹ 0.19 crore) (Total: ₹ 0.78 crore).

Implementing Agency	Project	Sanctioned capital cost	Agreed capital cost	As per provision		Actual expenditure		Excess expenditure	
				PP@4%	PS @4%	PP	PS	PP	PS
UJN, Srinagar	3.5 MLD STP upgradation Srinagar	405.28	350.00	14.00	14.00	27.02	-	13.02	-
	I&D with six STPs Rudraprayag	727.31	629.30	25.17	25.17	26.62	-	1.45	-
	I&D with two STPs Srikot	395.83	317.50	12.70	12.70	13.45	-	0.75	-
Total								15.22	
UJN, Gopeshwar	I&D with two STPs Badrinath	934.73	654.88	26.20	26.20	32.06	29.67	5.86	3.47
	I&D with two STPs Joshimath	3,706.76	2,921.03	116.84	116.84	93.47	129.96	-	13.12
	I&D with five STPs Chamoli	2,912.11	2,710.80	108.43	108.43	108.43	111.19	-	2.76
Total								5.86	19.35
Grand Total								104.75	78.18

PP or PS @ four per cent of (capital cost as per sanction or as per agreement whichever is less).

The State Government replied (May 2024) that expenditure on project preparation and supervision charges was as per actual expenses.

The reply is not acceptable as they overlooked the condition of limiting the expenses to the lower of AA&ES/agreement cost.

5.6 Short recovery of Liquidated damages

In compliance of Rule 43 of Uttarakhand Procurement Rules, 2017, specific provision is included in every contract for liquidated damages to be imposed upon the contractor for delay in completion of work. As per agreements, 0.50 per cent of the contract price per week was to be recovered from contractors as liquidated damage for delay in completion of works subject to maximum ceiling of 10 per cent of the contract price.

Audit noticed following instances where liquidated damage was imposed less on discretionary basis:

Contractors did not complete three works related to sewage projects in three IAs⁹ in due time. The works were completed late by 530 to 1,216 days. Divisions imposed only ₹ 0.89 crore against required liquidated damages of ₹ 20.59 crore. Thus, Department short recovered liquidated damages of ₹ 19.70 crore on agreed contract value of ₹ 205.88 crore (as detailed in *Appendix-5.2*).

The State Government replied (May 2024) that due to Covid-19 pandemic, land sliding and excess rainfall, schemes could not be completed within stipulated time.

The State Government's reply is not acceptable, as all construction activities related to 'Namami Gange' projects were officially permitted during the Covid-19 period and thus the pandemic does not justify the delay. Moreover, payment to contractors without

⁹ PM, UJN, Ganga Rishikesh, Srinagar and Gopeshwar.

imposing liquidated damages for delays due to monsoon and intermittent rainfall was unjustified, as such seasonal conditions are already accounted for in the project timelines, as per various government orders. Contractors are required to plan and mobilize resources to complete works on time despite seasonal hindrances. Additionally, the cited reasons land sliding and excess rainfall do not justify delays of 530 to 1,216 days. Hence, liquidated damages should have been recovered as per rules.

5.7 Lack of insurance cover for work under Namami Gange

Uttarakhand is a hilly state with severe rainfalls damaging numerous infrastructure projects/assets every year. Natural disaster during construction period of a project can unexpectedly raise cost of project. To ward off such unexpected cost escalation, government has included compulsory option of insurance in general conditions of contract and special condition of contract. The contractor at his own cost shall provide insurance cover. If the contractor does not provide the required insurance policies and certificates within stipulated time, the employer may affect the insurance and recover the premium from the contractor.

Scrutiny of records revealed that contractors under three IAs did not buy/renew insurance cover for works under nine agreements¹⁰. The cost of these agreement was ₹ 239.01 crore. It was not only against the general conditions of contract provisions but also exposed the schemes towards the risk of being affected by natural disasters and resulting in cost escalation on this count. The example of property loss, in the case of damage to STP near Anoop Negi School in Rudraprayag and loss of human lives in the case of electrocution in the Chamoli STP (**Case 1 and 2 of para 2.6 of Chapter 2**) highlight the need for having proper insurance of projects.

The State Government replied (May 2024) that as per conditions of contract bond, the insurance to be provided by contractor should be valid up to the end date of defect liability period.

The reply is not acceptable because all the agreements had been executed with the operation and maintenance (O&M) for 15 years. O&M period of all these STPs are running, and defect liability period is also still going on. So, work of O&M should also be insured.

5.8 Bank guarantee not renewed

As per general conditions of contract, the performance security shall be provided to the employer no later than the date specified in the letter of acceptance and shall be issued in an amount and form by a bank or surety acceptable to the employer and denominated

¹⁰ UJN, Rishikesh: (1) 18/GM/2017-18 (₹ 4.12 crore), (2) 20/GM/2017-18(₹ 67.02 crore), (3) 01/GM/2021-22 (₹ 6.38 crore); UJN, Gopeshwar: (4) 01/GM/2016-17 (₹ 1.40 crore), (5) 14/GM/2017-18 (₹ 10.48 crore); UJN, Srinagar: (6) 10/GM/2017-18(₹ 3.77 crore), (7) 02/GM/2019-20 (₹ 6.70 crore); UJN, Gopeshwar/Srinagar: (8) 15/GM/2017-18 (₹ 69.03 crore), (9) 19/GM/2017-18 (₹ 70.11 crore) (Total: ₹ 239.01 crore).

in Indian Rupees. The performance security shall be valid until a date 60 days from the date of expiry of defects liability period. Further, as per para-52.2, the performance security shall be released to the contractor after the completion of defects liability period and also when the Engineer has certified that all defects notified by the engineer to the contractor before the end of the period have been corrected.

Further as per contract data, the defects liability period is 12 months from the date of certification of completion of the whole work.

During scrutiny of records of IAs, it was seen that the bank guarantees of three agreements amounting to ₹ 2.18 crore¹¹ submitted for performance security had been expired and were not renewed by the contractors. Since O&M of these agreements are in running, IAs should take fresh/validated bank guarantee from the contractors.

The State Government accepted (May 2024) the fact and stated that contractors (related to UJS/UJN, Gopeshwar) had been asked for submission of renewed bank guarantee. In the meantime, executing agency has withheld the payments of O&M till submission of bank guarantee. Hence, fresh bank guarantee was awaited. In case of agreement related to Haridwar, it was informed that bank guarantee was renewed (in February 2024) up to October 2030.

5.9 Additional performance security not deposited

Uttarakhand Government has fixed (January 2013) additional performance security¹² for accepting the tender at the rate lower than the departmental rate in the construction works.

Audit noticed that General Manager (GM), Ganga entered (September 2017 and May 2018) into two agreements¹³ with contractors for construction of STPs. Agreement No.02/GM/2018-19 was executed at 7.05 *per cent* below of estimated cost whereas agreement No.11/GM/2017-18 was executed at 10.13 *per cent* below. As per above government order, amount of ₹ 4.76 crore¹⁴ and ₹ 3.10 crore¹⁵ should have been taken as additional performance security from respective contractors but it was not taken. Details are given in **Table-5.5** below:

¹¹ 01/GM/2018-19 (UJS Gopeshwar): ₹ 0.03 crore, 14/GM/2017-18 (UJN/UJS, Gopeshwar): ₹ 0.39 crore and 17/GM/2017-18 (UJS Haridwar): ₹ 1.76 crore (Total: ₹ 2.18 crore)

¹² The amount of additional performance security shall be worked out as follows:
(i) upto five *per cent* below the estimated cost: No additional performance security and
(ii) from five *per cent* below to 15 *per cent* below the estimated cost: an additional performance security of 0.5 *per cent* of the estimated cost for every one *per cent* below the estimated cost.

¹³ (1) Agreement No.-02/GM/2018-19 contract amount- ₹ 126.37 crore of UJN, Rishikesh (estimated cost: ₹ 135.96 crore) (2) Agreement No.-11/GM/2017-18 contract amount- ₹ 55.78 crore of UJN, Haridwar (estimated cost: ₹ 62.07 crore).

¹⁴ Agreement No.-02/GM/2018-19 estimated cost - ₹ 135.96 crore (₹ 135.96 crore X 0.50 *per cent* X 7 = ₹ 4.76 crore).

¹⁵ Agreement No.-11/GM/2017-18 estimated cost - ₹ 62.07 crore (₹ 62.07 crore X 0.50 *per cent* X 10 = ₹ 3.10 crore).

Table-5.5: Non deposit of additional performance security by contractors

Sl. No	Agreement No.	Estimated Cost (₹ in crore)	Rate of agreement (in per cent)	Add. Performance security (₹ in crore)
01	02/GM/2018-19	135.96	7.05 below	4.76
02	11/GM/2017-18	62.07	10.13 below	3.10
			Total	7.86

The State Government replied (May 2024) that department did not foresee any risk in execution of works and did not ask for additional performance guarantee.

The reply is not accepted as GM, Ganga overlooked provisions of financial rules in providing relaxation to the contractors.

5.10 Irregular expenditure from Namami Gange Funds

Standards of financial propriety (Rule 21 of General Financial Rules) stipulate that every officer is expected to exercise the same vigilance in respect of expenditure incurred from public moneys as a person of ordinary prudence would exercise in respect of expenditure of his own money. The expenditure should not be prima facie more than the occasion demands. Hence, any procurement of works should invariably follow principles of economy.

In 2016, SMCG submitted a DPR for upgradation of 27 MLD STP Jagjeetpur to tertiary treatment level to NMCG. An item 'Rehabilitation of Existing Digester and Sludge Drying Bed' with capital cost of ₹ one crore was also included in the DPR.

Scrutiny of records of Project Manager, Construction and Maintenance Unit (Ganga), UJN, Haridwar revealed that the digester item was neither related to the 27 MLD STP nor had anything to do with the tertiary treatment process, for which DPR was submitted. The digester was instead a part of 18 MLD STP Jagjeetpur and was intended for production of biogas. Hence proposing expenditure on this item for upgradation of 27 MLD STP Jagjeetpur to tertiary treatment was irregular.

The State Government replied (May 2024) that sludge generated in both the STPs (18 MLD and 27 MLD STP) was being treated together at sludge units. All the sludge from 18 MLD and 27 MLD was being pumped into digesters and then sent to sludge drying beds. Hence, digester and sludge drying units are integral part of both 18 MLD STP and 27 MLD STP.

The reply is not acceptable because digester was not used for treating sludge but for producing biogas which was not a tertiary treatment process. Hence, charging expenditure for digester and sludge drying beds from tertiary treatment plants was irregular.

5.11 Royalty and amount for District Mineral Fund not deducted

As per Uttarakhand Sub-Minerals (Avoidance) (Amendment) Rules 2016, mandatory contribution in District Mineral Fund (DMF) will be payable for extraction of minerals at the rate fixed from time to time. Further, as per Rule-10 of Uttarakhand District

Mineral Foundation Rule 2017, an additional amount equal to 25 *per cent* of royalty shall be deposited in the DMF.

During scrutiny of vouchers¹⁶ of forestry interventions for Ganga, it was noticed that royalty and DMF amounts were not deducted by divisions from contractor bills despite the fact that boulder and *bajri* were used during construction works. Further, the consumption statement of sub-minerals and Form-J/MM-11 was not enclosed with the bills/vouchers.

The State Government replied (May 2024) that works were executed by contractors in which minerals such as sand and gravel were not used by six IAs¹⁷.

The reply is not acceptable as it was noticed during scrutiny of vouchers that sand and gravel were used in the construction of walls, check dams, *etc.* Hence, non-deduction of royalty as well as DMF from the contractor's bills was irregular, and the divisions provided undue benefits to the contractors.

5.12 Labour cess not deducted

As per provisions of Uttarakhand Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2005, establishments which had employed on any day of the preceding 12 months, 10 or more building workers in any building or other construction work are required to pay labour cess at the rate not exceeding two *per cent* and not less than one *per cent* of the total cost of construction incurred by an employer.

During scrutiny of voucher of eight implementing offices, it was noticed that labour cess was not deducted by divisions from contractor bills, and they made a payment of ₹ 59.45 crore¹⁸ against the bills submitted by contractors without deducting the labour cess of ₹ 0.59 crore.

The State Government replied (May 2024) that deduction of labour cess was not made due to the non-provision of labour cess in the scheduled rates of the seven divisions¹⁹.

The reply is not acceptable as non-deduction of labour cess by the implementing offices was an undue favour to the contractor and violated provisions for labour welfare.

¹⁶ (1) Divisional Forest Officer (DFO), Soil Conservation, Lansdowne (Pauri) (2) DFO, Tehri Dam-I, New Tehri (3) DFO, Forest Division, New Tehri (4) DFO, Rajaji Tiger Reserve, Dehradun (5) DFO, Forest Division, Mussoorie (6) DFO, Forest Division, Haridwar.

¹⁷ Royalty challans have been deposited by three divisions (DFO, Rajaji Tiger Reserve, Dehradun, DFO, Forest Division, Rudraprayag and DFO, Forest Division, Haridwar).

¹⁸ (1) Alaknanda Soil Conservation Forest Division, Gopeshwar - ₹ 3.35 crore (2) Civil and Soyam Forest Division, Pauri-₹ 8.20 crore (3) Rudraprayag Forest Division - ₹ 6.59 crore (4) Tehri Dam I-₹ 15.71 crore (5) Tehri Forest Division - ₹ 12.70 crore (6) SC Division, Lansdowne - ₹ 8.20 crore (7) Gangotri National Park, Uttarkashi - ₹ 1.54 crore (8) DFO, Mussoorie - ₹ 3.16 crore (Total: ₹ 59.45 crore).

¹⁹ Deduction has been reported by one division (Alaknanda Soil Conservation Forest Division, Gopeshwar).

5.13 Recommendation

The State Government may review the instances of non-compliance as highlighted in this chapter and initiate appropriate remedial action.

Dehradun
The 25 June 2025



(SANJEEV KUMAR)
Accountant General (Audit)
Uttarakhand

Countersigned

New Delhi
The 01 July 2025



(K. SANJAY MURTHY)
Comptroller and Auditor General of India

Appendices

Appendix-2.1

(Reference: Paragraph 2.3.4; Page 10)

Details of lack of sewage connectivity in seven Ganga Front Towns

Sl. No.	Name of Town	STPs not connected to households	Details of Projects in these towns
1	Joshimath	02 (3.78 MLD)	Only I&D project sanctioned (March 2010) without any STP at a cost of ₹ 9.61 crore. Work closed in March 2017 after spending ₹ 9.57 crore. Another I&D with STP project sanctioned (March 2017) at a cost of ₹ 48.43 crore (₹ 62.40 crore revised in August 2021). Construction work completed in 2022. No household sewer connections are available in any STP due to lack of sewer network. STPs treat only grey water of five drains.
2	Nandprayag	02 (0.15 MLD)	Only I&D with STP project sanctioned (March 2017) at a cost of ₹ 6.46 crore (₹ 6.51 crore revised in January 2021). No household sewer connections are available in any of the two STPs due to lack of sewer network. STPs treat only grey water of three drains.
3	Karnaprayag	05 (0.35 MLD)	One I&D project and one STP (1.40 MLD) project sanctioned simultaneously (December 2008 & July 2009) at a total cost of ₹ 8.81 crore. Only partial I&D work got done worth 0.95 crore and both the projects abandoned. Another I&D with five STPs project sanctioned (March 2017) at a cost of ₹ 12.09 crore (₹ 12.01 crore revised in September 2021). No household sewer connections are available in any of the five STPs due to lack of sewer network. STPs treat only grey water of seven drains.
4	Rudraprayag	06 (0.525 MLD)	One I&D with one STP (three MLD) project sanctioned (September 2009) at a cost of ₹ 12.62 crore (I & D work: ₹ 7.92 crore and STP: ₹ 4.70 crore). Only partial I&D work got done worth ₹ 0.71 crore and project abandoned. Work related to STP could not be started and abandoned. Another I&D with six STPs project sanctioned (March 2017) at a cost of ₹ 13.15 crore. No household sewer connections are available in any of the six STPs due to lack of sewer network. STPs treat only grey water of eight drains.
5	Kirtinagar	02 (0.060 MLD)	Only I&D with two STPs project sanctioned (March 2017) at a cost of ₹ 4.23 crore. No household sewer connections are available in any of the two STPs. Both the STPs treat only grey water from drains.
6	Chamoli (Near Old Suspension Bridge)	01 (0.05 MLD)	This STP was part of an I&D with STP project sanctioned (March 2017) at a cost of ₹ 61.83 crore (₹ 64.34 crore revised in October 2022). No household sewer connections are available in this STP. It treats only grey water from one drain.
7	Srinagar (01 MLD STP) + Srikot (2 STPs)	03 (1.125 MLD)	Srinagar: Only I&D with STP of one MLD project sanctioned (March 2017) at a cost of ₹ 22.51 crore. No household sewer connections are available in this STP. They treat only grey water from 10 drains. Srikot: Only I&D with two STPs of 75 KLD & 50 KLD project sanctioned (March 2019) at a cost of ₹ 7.86 crore. No household sewer connections are available in these two STPs. They treat only grey water from two drains.
Total		21 (6.04 MLD)	

Source: Minutes of Joint Physical Inspections of STPs and PM, UJN, Ganga, Srinagar and Gopeshwar.

Appendix-2.2

(Reference: Paragraph 2.4.4; Page 20)

List of the STPs operating without Consent to Operate (CTO)

Sl. No.	Name of the STPs operating without CTO	Validity to operate of STPs
1	0.050 MLD STP Near old Suspension Bridge Chamoli	31-03-2021
2	1.190 MLD STP at Vivekanand Colony, Gopeshwar	31-03-2020
3	1.120 MLD STP at Baitarani Gopeshwar	31-03-2020
4	0.050 MLD STP at Sangam Road Nandprayag	31-03-2021
5	0.050 MLD STP Near Police Chowki Karnaprayag	31-03-2021
6	0.010 MLD STP, Near Temple Kirtinagar	Returned for non-compliance
7	2.0 MLD STP at Gyansu Uttarkashi	Returned for non-compliance
8	1.0 MLD STP at Gangotri Uttarkashi	31-03-2021

Source: Uttarakhand Pollution Control Board Dehradun.

Appendix-2.3
(Reference: Paragraph 2.4.5; Page 20)

List of 18 STPs not taken over by maintenance agency due to operational and safety related issues

Sl. No.	Town	Programme under which constructed	Name of STP with capacity	Completed year	Deficiencies/Reasons for not being taken over of STPs
1	Srinagar	Ganga Action Plan	3.50 MLD Srinagar	May 2019	Various deficiencies (like no arrangement of disposal of sludge, damaged boundary wall, sample reports of effluent in inlet and outlet are not as per prescribed standard) in STP affect its functioning and have stopped UJS from taking over of STP despite repeated requests of UJN.
2	Devprayag	NGRBA	0.075 MLD Shanti Bazar	July 2018	Leakage in various main holes and sewage directly flowing in river/overflow/toilet in both the STPs are damaged. These deficiencies in STPs affect their functioning and have stopped UJS from taking over of these STPs despite repeated requests of UJN.
3		NGRBA	0.150 MLD Sangam Bazar	July 2018	
4	Haridwar	Namami Gange	68 MLD Jagjeetpur	June 2020	Both STPs will be run by UJN up to completion of capex as per instruction of NMCG.
5		Namami Gange	14 MLD Sarai	June 2020	
6	Rishikesh	Namami Gange	5 MLD Chorpani	September 2020	In both the STPs sewage coming in excess of their treatment capacity which affect their functioning and have stopped UJS from taking over of these STPs despite repeated requests of UJN.
7		Namami Gange	7.5 MLD Chandreshwar Nagar Muni-ki-Reti Dhalwala	September 2020	
8		Namami Gange	26 MLD Lakkarghat	September 2020	
9	Srikot	Namami Gange	0.050 MLD Srikot	February 2021	No joint inspection of both the STPs is carried out by UJN and UJS.
10		Namami Gange	0.075 MLD Srikot	February 2021	
11	Rudraprayag	Namami Gange	0.100 MLD Near Rudra complex	March 2019	Damaged drains, no arrangement of water connection and toilet, nonfunctional of filter press and drain feed pump, no protection wall, no arrangement of sludge dumping.
12		Namami Gange	0.075 MLD Near Bus Stand	May 2019	
13		Namami Gange	0.100 MLD STP 4	May 2019	
14		Namami Gange	0.050 MLD STP 6 Near Belni Road	November 2020	

Sl. No.	Town	Programme under which constructed	Name of STP with capacity	Completed year	Deficiencies/Reasons for not being taken over of STPs
15	Karnprayag	Namami Gange	0.100 MLD STP 2 Near Purana Pul	May 2019	Non-functional filter feed pump, sludge feed pump, grey water of drains directly flowing into Pinder River without treatment, tapped dry drain in one STP near purana bridge.
16		Namami Gange	0.050 MLD STP 4 Near Naya Pul	November 2020	
17		Namami Gange	0.100 MLD STP 5 Near Ward No. 1 & 3	March 2019	
18	Joshimath	Namami Gange	2.70 MLD STP 2 Marwari	March 2023	Due to various deficiencies in STP noticed during physical inspection in May 2023 viz Back flow from grit chamber, no flowmeter on inlet and outlet, leakage from weepholes, no arrangement for sludge disposal. UJS not ready for taking over this STP before rectification of these deficiencies by UJN.

Source: Information collected from Implementing agencies, PM, Mechanical Division Ganga, GM, UJN, Namami Gange and UJS divisions.

Appendix-4.1

(Reference: Paragraph 4.3; Page 36)

Water quality criteria according to CPCB

Water Quality Criteria	Class of Water	Designated-Best-Use
<ul style="list-style-type: none"> Total Coliforms Organism MPN/100 ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6 mg/l or more Biochemical Oxygen Demand 5 days 20⁰ C 2 mg/l or less 	A	Drinking Water Source without conventional treatment but after disinfection
<ul style="list-style-type: none"> Total Coliforms Organism MPN/100 ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5 mg/l or more Biochemical Oxygen Demand 5 days 20⁰ C 3 mg/l or less 	B	Outdoor bathing (Organised)
<ul style="list-style-type: none"> Total Coliforms Organism MPN/100 ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4 mg/l or more Biochemical Oxygen Demand 5 days 20⁰ C 3 mg/l or less 	C	Drinking water source after conventional treatment and disinfection
<ul style="list-style-type: none"> pH between 6.5 to 8.5 Dissolved Oxygen 4 mg/l or more Free Ammonia (as N) 1.2 mg/l or less 	D	Propagation of Wildlife and Fisheries
<ul style="list-style-type: none"> pH between 6.0 to 8.5 Electrical Conductivity at 25⁰ C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2 mg/l 	E	Irrigation, Industrial Cooling, Controlled Waste Disposal
Not Meeting A, B, C, D & E Criteria	Below-E	Use not specified

Appendix-5.1
(Reference: Paragraph 5.4; Page 47)

Commencement of work before obtaining technical approval from competent authority

Sl. No.	Division	Work executed	Agreement No.	DoS as per agreement	Date of technical sanction
1	EE, ID, Rudraprayag	Koteshwar Mahadev Bathing Ghat (B G)	02/SE/2017-18	17.11.2017	28.02.2018
		Gholtir Cremation Ghat (CG)			
2	EE, ID, Tharali	Gaucher C G	01/SE/2017-18	17.11.2017	28.02.2018
		Karnprayag C G			
		Karnprayag B G/C G			
3	EE, ID, Srinagar	Umarkot C G	01/SE/2017-18	17.11.2017	28.02.2018
		Nandprayag B G			
		Nandprayag C G			
		Chamoli C G			
4	EE, ID, Uttarkashi	Kedar (B G)/ (C G)	02/SE/2017-18	04.12.2017	28.08.2018
		Manikarnika B G	04/SE/2017-18	04.12.2017	17.01.2018
		Jad Bharat B G	03/SE/2017-18	04.12.2017	19.01.2018
		Heena B G/C G	05/SE/2017-18	12.12.2017	28.08.2018
		Nageshwar B G	06/SE/2017-18	22.12.2017	28.08.2018
		Dunda C G	01/SE/2017-18	04.12.2017	28.08.2018

Appendix-5.2
(Reference: Paragraph 5.6; Page 48)

Short recovery of Liquidated damage for delay in execution of works related to sewage projects

(₹ in crore)

Sl. No.	Division	Bond No.	Contract value	Schedule Date of Start	Schedule Date of Completion	Actual Date of Completion	Delay (in days)	LD should be imposed	LD Imposed	Short recovery of LD
1	UJN, Ganga, Gopeshwar	14/GM/2017-18	10.48	20.11.2017	19.05.2019	31.10.2020	530	1.05	0.09	0.96
2	UJN, Ganga, Gopeshwar/Srinagar	15/GM/2017-18	69.03	20.11.2017	19.02.2019	31.05.2021	830	6.90	0.80	6.10
3	UJN, Ganga, Rishikesh	02/GM/2018-19	126.37	31.05.2018	30.11.2019	31.03.2023	1,216	12.64	0.002	12.64
		Total	205.88				530 to 1,216	20.59	0.89	19.70

Glossary

Glossary

Sl. No.	Abbreviation	Expanded Form
1.	AA&ES	Administrative Approval and Expenditure Sanction
2.	AMRUT	Atal Mission for Rejuvenation and Urban Transformation
3.	APOs	Annual Plan of Operations
4.	BG	Bathing Ghat (Appendix 5.1)
5.	BOD	Biochemical Oxygen Demand
6.	BRO	Border Roads Organisation
7.	CG	Cremation Ghat (Appendix 5.1)
8.	C&AG	Comptroller and Auditor General of India
9.	cal/g	Calories per gram
10.	CAMPA	Compensatory Afforestation Fund Management and Planning Authority
11.	CCA	Consolidated Consent and Authorization
12.	CFI	Consolidated Funds of India
13.	COD	Chemical Oxygen Demand
14.	CPCB	Central Pollution Control Board
15.	CPHEEO	Central Public Health and Environmental Engineering Organization
16.	CTO	Consent to operate
17.	DFO	Divisional Forest Officer
18.	DGCs	District Ganga Committees
19.	DM	District Magistrate
20.	DMF	District Mineral Fund
21.	DO	Dissolved Oxygen
22.	DPR	Detailed Project Report
23.	EE ID	Executive Engineer Irrigation Division
24.	EE MD UJS	Executive Engineer Maintenance Division Uttarakhand Jal Sansthan
25.	E&M	Electrical & Mechanical
26.	FC	Faecal Coliform
27.	FCO	Fertilizers Control Order
28.	GAP	Ganga Action Plan
29.	GM	General Manager
30.	GoI	Government of India
31.	GST	Goods and Services Tax
32.	Hec	Hectare
33.	ID	Irrigation Division
34.	I&D	Interception & Diversion
35.	IAs	Implementing Agencies
36.	IIT	Indian Institutes of Technology
37.	ITI	Industrial Training Institute
38.	KfW	Kreditanstalt-für-Wiederaufbau

Sl. No.	Abbreviation	Expanded Form
		(A German Development Bank)
39.	KLD	Kiloliter per day
40.	LPG	Liquefied Petroleum Gas
41.	MCS	Master Control Station
42.	mg/kg	Milligrams per kilogram
43.	mg/l	Milligram per liter
44.	ML	Milliliter
45.	MLA	Member of Legislative Assembly
46.	MLD	Million liters per day
47.	MoEF & CC	Ministry of Environment, Forest and Climate Change
48.	MPN	Most Probable Number
49.	NABL	National Accreditation Board for Testing and Calibration Laboratories
50.	NGRBA	National Ganga River Basin Authority
51.	NGT	National Green Tribunal
52.	NMCG	National Mission for Clean Ganga
53.	O&M	Operation and Maintenance
54.	OCEMS	Online Continuous Effluent Monitoring System
55.	pH	Potential of Hydrogen
56.	PM (Mech) UJN	Project Manager (Mechanical) Uttarakhand Peyjal Nigam
57.	PM UJN	Project Manager Uttarakhand Peyjal Nigam
58.	PP	Project Preparation
59.	PS	Project Supervision
60.	SMCG	State Mission for Clean Ganga
61.	SPCB	State Pollution Control Board
62.	SMP	Sludge Management Plant
63.	STP	Sewage Treatment Plant
64.	SWM	Solid Waste Management
65.	TDS	Total Dissolved Solids
66.	THDC	Tehri Hydroelectric Development Corporation
67.	TSS	Total Suspended Solid
68.	TTPs	Tertiary Treatment Plants
69.	UJN	Uttarakhand Peyjal Nigam
70.	UJS	Uttarakhand Jal Sansthan
71.	UKPCB	Uttarakhand Pollution Control Board
72.	ULBs	Urban local bodies
73.	UPDCC	Uttarakhand Project Development and Construction Corporation Ltd.

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