Chapter 6

6 Chapter Conservation of Flora & Fauna and Maintenance of Ecological Flow

6.1 Introduction

The River Ganga is home to many threatened and sensitive ecosystems[75] along with a large variety of rare, endangered and threatened faunal species[76] and supports more than 25,000 floral and faunal species. Forested basins supply a high proportion of freshwater for various uses and ecological needs. Riparian forests act as 'natural buffers' and 'biological filters' as they facilitate functions of purification of water for the dynamic flow of river and its water quality.

River flow is one of the main drivers of biodiversity in rivers, and a river's flow regime – the variation of high and low flows through the year as well as variation over the years – exerts great influence on its ecosystem.

One of the objectives of NGRBA (2009) was to undertake measures relevant to river ecology. This was further reemphasised in the River Ganga (Rejuvenation, Protection and Management) Authority Order (2016) in which it was stated that the River Ganga shall be managed in an ecologically sustainable manner, the lost natural vegetation in catchment area shall be regenerated and maintained and the aquatic and riparian biodiversity in the River Ganga Basin shall be regenerated and conserved.

This Chapter deals with audit findings relating to programmes/projects sanctioned by NMCG for conservation of flora, fauna, ecological flow and special properties of the River Ganga.

6.2 Projects for Flora, Fauna and Ecological Flow

NMCG approved six projects (2015-16) for conservation of flora, fauna, maintenance of ecological flow and assessment of special properties of the River Ganga with sanctioned cost of ₹ 37.58 crore. The details are given in Table 6.1.

[75] The glaciers, alpine meadows, diverse upland forests, tarai grasslands and swamps, riparian forests, mangroves, etc.

[76] Gangetic dolphin, otters, critically endangered gharial, mugger or Indian marsh crocodile, Estuarine crocodile and at least 12 species of freshwater turtles including critically endangered *Batagurkachuga* and several species of fish such as critically endangered Gangetic shark, Gangetic stingray, Mahseers, Hilsa and several species of endemic freshwater crabs. In addition, water birds and island nesting birds are important component of the Ganga River Basin.

Table 6.1: Details of projects for flora, fauna and ecological flow

(₹ in crore)

Agencies	Project	Sanctioned cost	Release	Expenditure (up to March 2017)	Utilization (in *per cent*)
1. Forest Research Institute (FRI), Dehradun	**(1)** Forestry Intervention for Ganga. (September 2015)	1.18	1.18	1.19	100
2. Wildlife Institute of India (WII), Dehradun	**(2)** Biodiversity conservation and Ganga Rejuvenation Part-I (June 2016)	24.84	10.23	1.91	19
	(3) Biodiversity conservation and Ganga Rejuvenation Part-II (September 2016)				
3. Central Inland Fisheries Research Institute (CIFRI), Kolkata	**(4)** Assessment of fish and fisheries of the River Ganga system for developing suitable conservation and restoration plan. (July 2015)	5.80	2.36	0.41	17
4. National Environmental Engineering Research Institute (NEERI), Nagpur	**(5)** Assessment of Water Quality and Sediment Analysis to understand the special property of the River Ganga. (March 2015)	5.00	4.50	3.75	83
5. State Forest Department (SFD), Bihar	**(6)** National Dolphin Survey (November 2015)[77]	0.76	0	0	0

The extent of utilization of fund was low in case of projects executed by WII and CIFRI which was 19 *per cent and 17 per cent* respectively. The important audit findings in respect of five projects are discussed in succeeding paragraphs.

6.3 Forestry Interventions for Ganga (FIG)

NMCG sanctioned a project to Forest Research Institute (FRI) for DPR preparation of "Forestry Interventions for Ganga (FIG)" in February 2015 at an outlay of ₹ 1.18 crore. FRI was to identify possibilities for regeneration/improvement of forest catchment areas and its treatment through appropriate native local species. FRI prepared and submitted the DPR on FIG (March 2016).

[77] The project was not mentioned in the list of projects provided by NMCG to Audit. However, during audit of SPMG, Bihar, the status was ascertained. It was also found mentioned in the action plan for Ganga Rejuvenation submitted by Group of Secretaries (2014).

NMCG approved the DPR (March 2016) prepared by FRI for FIG, consisting of four components i.e. natural landscaping, agricultural landscaping, urban landscaping and conservation activities for implementation in five Ganga main stem States, viz. Bihar, Jharkhand, Uttarakhand, Uttar Pradesh and West Bengal, under Phase-I (2016-21).

We observed the following in implementation of components executed by NMCG:

6.3.1 Non-establishment of National Project Facilitation Unit

The project awarded to FRI also envisaged setting up of a National Project Facilitation Unit (NPFU) to act as National Level Partner Organisation for strengthening knowledge management and capacity building for conservation of riverscapes. However, NPFU was not set up despite proposal made by FRI. NMCG was yet to confirm and communicate its stand in respect of the proposal as of July 2017.

NMCG (August 2017) did not furnish specific reply to the audit observation.

6.3.2 Non-replication of scheme on other tributaries of the Ganga

The scheme (FIG) was to be replicated on the tributaries of the Ganga from the end of third year of execution of the implementation plan. However, NMCG did not initiate any plan for replication and scaling up of planned efforts in additional sites/States. Although NMCG requested FRI to submit a proposal to prepare the DPR of "Forestry Interventions of Yamuna (FIY)" (July 2015), NMCG did not award the work to FRI.

NMCG stated (May 2017) that due to non-availability of funds; it could not implement the programme and requested MoEF&CC to allot funds through Compensatory Afforestation Fund Management and Planning Authority. However, no funds were allocated by MoEF&CC as of August 2017.

It is pertinent to mention that surplus funds were available with NMCG at the end of 2015-16 and 2016-17 as indicated in the para 2.2.1 of this Report.

6.3.3 Role of Project Steering Committee

NMCG constituted Project Steering Committee (PSC) at National level (August 2016) for monitoring and steering the implementation of the DPR. However, details of meeting were not furnished to Audit.

Regarding the inadequate coverage of the DPR, non-establishment of National Project Facilitation Unit, non-replication of scheme on other tributaries of the Ganga, role of Project Steering Committee, NMCG stated (August 2017) that it was due to non-availability of appropriate funds in the approved biodiversity component.

6.3.4 Afforestation projects by States

As per the DPR of FIG, forestry interventions, were to be carried out by the States Forest Departments (SFDs) of five States namely Bihar, Jharkhand, Uttarakhand, Uttar Pradesh and West Bengal. We observed the following:

6.3.4.1 Non-utilization of fund and slow progress of work

NMCG sanctioned (July and September 2016) ₹ 50.63 crore (2.21 *per cent* of estimated cost) to the five States and up to March 2017 an expenditure of ₹ 30.79 crore (61 *per* cent) was incurred leaving a balance of ₹ 9.71 crore (24 *per cent* unutilized) due to delay in sanctioning of the projects by NMCG. State-wise savings ranged from 11 *per cent* (Jharkhand) to 48 *per cent* (West Bengal). In Bihar there was an excess expenditure of ₹ 1.21 crore.

As per project schedule para 19 (DPR, Volume-I), SFDs were to ensure initiation of preparatory and actual plantation activities in the ensuing monsoon season for successful plantation work. As per the DPR, Forestry Intervention for Ganga (FIG) (Phase I) were to be implemented at an estimated cost of ₹ 2,293.73 crore.

State-wise observations are as followings:

a. All States except Bihar, reported non-completion of advance works and shortfall in plantation.
b. In Jharkhand, 49 *per cent* of the advance work (174 out of 355 hectares) was completed.
c. In Uttar Pradesh (Allahabad), the progress of plantation work was only 67 *per cent*.
d. In Uttarakhand, no plantation was carried out and progress of advanced work was 97 *per cent*.

Due to delay in sanction (during monsoon season), SFDs could not complete the work of plantation of trees in the same year since the advance works like digging of pits were not completed before monsoon season to enable timely plantation.

6.3.4.2 Inadequate coverage

As per the DPR, FIG comprised (i) Natural, (ii) Agriculture and (iii) Urban Landscapes and (iv) Conservation activities. The States were to plant medicinal and other local/appropriate species in the identified districts/divisions. State-wise observations are as follows:

a. There was no plan of conservation, interventions for FIG in nine divisions[78] of Uttarakhand.

b. In Bihar and Jharkhand, interventions for Agriculture and Urban Landscape were not undertaken.

[78] Alaknanda Soil Conservation; Gopeshwar Soil Conservation; Civil Soyam and Garhwal Forest Divisions; Pauri; Mussoorie; Dehradun; Narendra Nagar; Gangotri National Park; and Uttarkashi Forest Division.

c. In Bihar, conservation and support activities were not undertaken.

d. In Uttarakhand, shortfall under natural landscape, agricultural landscape, urban landscape and conservation interventions were 57 *per* cent (12 out of 21 divisions), 54 *per cent* (seven out of 13 divisions), 71 *per cent* (10 out of 14 divisions) and 42 *per cent* (five out of 12 divisions) respectively.

e. In Uttar Pradesh, at Allahabad only five[79] (out of 21 planted) species and in Varanasi only two[80] (out of eight planted) species were planted as per the species specified (12 numbers) in the DPR.

We found that short achievement of targets was actually a result of delayed release of funds to the divisions.

6.4 Conservation of Fauna

NMCG sanctioned two projects for "Biodiversity conservation and Ganga Rejuvenation'' at a total cost of ₹ 24.84 crore to Wild Life Institute of India (WII), Dehradun in June 2016 and September 2016 respectively for three years each, to develop a science based aquatic species restoration plan for the River Ganga by involving multiple stakeholders having various components.

- WII was to appoint 26[81] and 70[82] project personnel under the Part 1[83] and Part 2[84] of the project, by end of December 2016 and March 2017 respectively. However, WII engaged two Project Scientists, 10 Project Associates, 16 Project Fellows, one Database operator, five Project Assistants and four Project Management Unit Personnel i.e. 38 personnel and the remaining ones are in the process of engagement.
- WII was to conduct the stakeholder analysis in first half of the first year of the project. However, the consultations were conducted (June-December 2016) by WII only in Uttar Pradesh.

NMCG accepted (August 2017) the fact and stated that stakeholder consultations have been initiated in Uttar Pradesh, Uttarakhand and West Bengal.

- We noticed that there was delay in designing the training syllabus for spearhead team by WII and it did not validate and implement the syllabus within first half of the first year. We also observed that no training was organised in other places

[79] Syzygiumcumini, Azadirachlaindica, Dalbergiasissoo, Ficusreligiosa & Delonixregia.
[80] Swietenia Mahagni and Delonixregia.
[81] One project scientist, two Project Associates, one Rescue and Rehabilitation Officer, six project fellows and other staff
[82] Three Project Scientists, nine Project Associates, 15 project fellows and other staff
[83] Establishment of Aqua life conservation monitoring centre, capacity building and Rescue and Rehabilitation centres
[84] Planning aquatic species restoration, community based conservation programmes and nature interpretation and education for biodiversity conservation

except Lucknow and Meerut. WII stated (April 2017) that the process of training would be initiated, with effect from June-July 2017.

NMCG stated (August 2017) that the spearhead team to carry forward the project activities in future has been formed for the States of Uttar Pradesh and West Bengal. Once communications are received from other States, a combined training programme for the spearhead team will be initiated post-monsoon.

6.5 Maintenance of Ecological Flow

Aviral Dhara or continuous flow[85] is important for restoring the wholesomeness of the River Ganga. NGRBA notification (2009) emphasised the urgent need "to maintain *ecological flow* in the River Ganga with the aim of ensuring water quality and environmentally sustainable development".

As per River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, there is urgent need to maintain ecological flows[86] in the River Ganga with the aim of ensuring continuous flows throughout its length so as to restore its ecological integrity that enables it to self-rejuvenate. It emphasizes that every State Government shall also endeavour to maintain adequate flow of water and all concerned authorities shall take suitable actions in a time bound manner.

NMCG did not identify places of discontinuity of water flow due to engineered diversion or storage and did not initiate any remedial action thereof.

NMCG did not determine the magnitude of ecological-flow at different points for the River Ganga. It also did not assess the linkage between ecological flow and water quality. It was in the process of obtaining data on flow during different seasons, for the period 2015-17 from Central Water Commission.

Thus, NMCG has neither formulated the parameters for determination of ecological flow at different points nor identified the particular impediments affecting the flow.

NMCG stated (August 2017) that the quantification of magnitude of ecological flow is a complex issue having multi-pronged effects on the several competitive stakeholders ranging from irrigation, industrial, power and social sector in the entire Ganga Basin. Finalization of appropriate/rational environmental flow in the context of all the stakeholders and simultaneously addressing abating the pollution by making available

[85] Means flow of water – along with sediments, nutrients and other natural constituents of the flow – are continuous and adequate throughout the Ganga river network. Both longitudinal connectivity and adequate flows in rivers are essential to maintain *Aviral Dhara*.

[86] Environmental flows are a regime of flow in a river that mimics the natural pattern of a river's flow, so that the river can at least perform its minimal natural functions such as transporting water and solids received from its catchment and maintaining its structural integrity, functional unity and biodiversity along with sustaining the cultural, spiritual and livelihood activities of people.

sufficient quantity of water into the river requires broad based consultations with all the States and stakeholders.

While we agree that the magnitude of ecological flow is a complex exercise, the same needs to be addressed in a time bound manner to adopt suitable strategies accordingly. However, NMCG has neither determined ecological flow nor identified the places of discontinuity of water flow with reasons thereof for initiating corrective actions.

6.6 Special properties of the River Ganga

NMCG sanctioned (March 2015) ₹ five crore to National Environmental Engineering Research Institute (NEERI), Nagpur for "Assessment of Water Quality and Sediment Analysis to understand the special properties of Ganga River" to be completed within stipulated time period of 15 months.

NEERI was required to submit Quarterly Physical Progress Reports (QPPR) by fifth day of every quarter, to NMCG. However, NEERI did not submit any QPPR. In the absence of QPPR, there was no mechanism with NMCG to monitor the progress of the project. NEERI stated (May 2017) that considerable time was required for preparation for field visit, collection of water samples, analysis of water samples, data analysis and interpretation and report preparation to arrive at tangible outcome.

NMCG (August 2017) agreed with the audit observation.

Further, NEERI was to develop framework separately for initiating actions to rejuvenate the River Ganga. Although NEERI made specific recommendations in its draft report, these did not reveal any separate framework.

NMCG stated (August 2017) that NEERI has recently received comments from Central Water Commission (CWC). Based on the CWC comments the framework has been updated. NEERI was still awaiting response from CPCB and other organizations. On receipt of response from all the organizations, the framework will be finalized and included in the report accordingly.

While we do agree with the reply that all stakeholders should be involved in the Ganga Rejuvenation framework, NEERI and NMCG should adhere to the timeline prescribed for completion of the project and plan its activities accordingly.

6.7 Conclusion

The number of projects for conservation for flora, fauna and river flow were very limited as compared to projects for pollution abatement and river front development. The long term action plan for Ganga Rejuvenation was yet to be finalised based on Ganga River Basin Management Plan. As such, ecology and biodiversity conservation

efforts of NMCG were at a very initial stage and it suffered from deficiencies in programme implementation. There were short release of funds for forestry interventions, coverage on ground for biodiversity conservation and non-sanction of any projects for study of the maintenance of ecological flow.

6.8 Recommendations

We recommend that

i. NMCG may identify threats and implement programmes/schemes to maintain the Ganga river ecology and conserve flora and fauna in sustainable and time bound manner.

ii. NMCG may on priority address the concerns of *Aviral Dhara* by identifying the discontinuity of flow of the River Ganga water due to engineering diversion or storage so as to determine and maintain the ecological flow.