

## Unprepared for Flood Disasters

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Due to repeated failures in governance and management, floods have turned out to be disastrous in India. As per estimates made in 1980, if India's total geographical area of 329 million hectares, about 45.64 million hectares are flood-prone. The Working Group for the Flood Management Programme for the XI Five Year Plan (December 2006) estimates that, on an average, 7.55 million hectares get affected, 1560 lives are lost and damages worth Rs 1805 crore is caused due to disastrous floods every year in India.

This article presents an account of how has the Central government and State governments performed on the front of flood forecasting, flood management and disaster preparedness. While, the subject 'flood control' doesn't find a mention in any of the three legislative lists under the Constitution of India, 'Drainage and Embankments' are mentioned under the State list. Given such a nature of legislative priority, schemes on flood control and flood management are planned, investigated and executed by State governments with their own resources. The Union Government renders assistance to States, which is technical, advisory, catalytic and promotional in nature. The Ministry of Water Resources, River Development and Ganga Rejuvenation provides technical guidance, conducts scrutiny, clearance and monitoring of the irrigation, flood control and multi-purpose projects. The Union Ministry is also responsible for operation of the central network for flood forecasting and issuing warnings on inter-state rivers.

Due to unprecedented floods of 2004 in Assam, Bihar and West Bengal that resulted in heavy loss of life and property, a Task Force on

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Flood Management was constituted by the Union Ministry of Water Resources.

Many decades before this, in 1976, the Central government had constituted Rashtriya Barh Aayog (National Flood Commission). Rashtriya Barh Aayog (RBA henceforth) was tasked with identifying flood prone areas and recommend the steps to reduce annual damage occurring due to floods. RBA submitted its report in March 1980. The recommendations of RBA were forwarded (in September 1981) to all States/UTs/Ministries. State governments and UTs were asked to verify the estimates of area liable to floods and furnish the data along with connected maps to Central Water Commission (CWC) and Ganga Flood Control Commission (GFCC) before March 1982.

In November 2007, the Central government introduced a scheme named Flood Management Programme, with allocation of Rs 8000 crore in XI Five Year Plan and Rs 10000 crore in XII Five Year Plan. Under this programme, central assistance was available to States for undertaking works related to (i) river management, (ii) flood control (iii) anti-erosion and (iv) drainage development etc.

As indicated in the Report of Working Group on Flood Management for XIth Plan (October 2011), State governments and UTs were yet to take up scientific assessment of flood prone areas detailing at micro level and giving comprehensive details on frequency of flooding, duration and depth of inundation. As per a performance audit of schemes for flood control and flood management by CAG of India (Report No 10 of 2017), out of the selected 17 States/UTs, only Assam and Uttar Pradesh had verified the flood prone area figures that were identified more than three decades back in RBA report. Underlining the gross neglect of the first recommendation of RBA report, performance audit pointed out that only Assam and Uttar Pradesh had furnished data along with connected maps to CWC/GFCC.

Elaborating on its recommendation on scientific assessment of flood prone areas, RBA had tasked CWC and GFCC with the following activities:

Flooded area at any time during the period for which records have been maintained should be transferred by the authorities in States/UTs on a detailed map of the river basin to CWC/ GFCC.

CWC/GFCC should (on receipt of such detailed river basin maps) carry out test checks in the field and update the river basin maps every five years.

CWC should undertake a comprehensive study and lay down criteria for defining 'flooded area.'

CAG auditors approached CWC for the records pertaining to these activities, but realized that "CWC did not have any information" on these activities.<sup>1</sup> Replying to this audit observation, the Ministry stated in its reply dated August 2016 that "an expert committee for the scientific assessment of flood prone area in India had been constituted in CWC in July 2012 and three meetings (in August 2012, June 2013 and September 2013) have been held so far." The performance audit also tells us that "in its second meeting, the expert committee recommended that Regional Committees be constituted for each State/UTs." Such regional committees were envisaged to identify, demarcate and classify the Flood Prone Areas based on the prescribed methodology, classification and criteria. The performance audit also underlines the fact that in its third meeting, the expert committee laid out ten activities to be undertaken by regional committees with timeline. As per this timeline, regional committees were supposed to submit preliminary report on flood prone areas by 28<sup>th</sup> February 2016. It was envisaged that the national level expert committee was to give its feedback and submit preliminary report by 31<sup>st</sup> March 2016. Following this, regional committees were tasked with submitting the final report by 31<sup>st</sup> May 2016 and the national level expert committee was supposed to submit its final report by 31<sup>st</sup> July 2016.

During its performance audit, CAG auditors found that while "regional committees for all 36 States/UTs had been constituted," "till July 2016, out of the selected 17 States/UTs, scientific assessment of Flood Prone Areas by the regional committees was taken up only in Bihar, Haryana, Kerala, Odisha, Punjab and West Bengal."

Voicing severe indictment of States/UTs, CAG auditors point out that "in the remaining 12 States/UTs, the scientific assessment of FPA was yet to be started." What is even more revealing is the fact that got unearthed during audit scrutiny of records in Arunachal Pradesh, Madhya Pradesh and Uttar Pradesh where regional committees continued to exist only on papers and no activities worth the name could be shown since "no meetings of the regional committee were held as of February 2016."<sup>2</sup>

Would the CWC and Ministry make public the minutes of three meeting held so far and would it toll flood affected people what progress has been made by this expert committee on the scientific assessment of flood prone areas?

Another recommendation of RBA tasked State governments/UTs with carrying out surveys and indicate the area that can be extended

protection against flood damage. RBA also desired that such an assessment of areas that can be extended protection against flood damage every five years. Acting on this recommendation, CWC requested States/UTs in September 1981 to initiate the surveys.

However, during the performance audit, it was found that out of 17 States/UTs, only five States (Bihar, Himachal Pradesh, Odisha, Tamil Nadu and Uttar Pradesh) had furnished details of the area which was provided with reasonable protection. The remaining States/UTs did not carry out the field surveys and failed to indicate the extent of area that could be extended protection.

In a shocking observation, CAG auditors also tells us that “None of the selected 17 States/UTs had carried out periodical reviews of assessment of protectable areas every five years!”

### **Frequency Based Flood Inundation Maps and Digital Elevation Models for Flood Affected Areas**

Clause 10.6 of the National Water Policy (2012) stipulates preparation of Frequency Based Inundation Maps. Similarly, recommendation 28 of the 21st Parliamentary Standing Committee on Water Resources for 2013-14, stipulates preparation of Digital Elevation Models (DEMs) to demarcate flood affected areas that were facing perennial flood ravages, especially in the Ganga basin States.

CAG auditors point out shameful neglect on this aspect as well stating: “From the 17 States/UTs covered in audit, we found that only Bihar and Odisha prepared Frequency Based Inundation Maps.”<sup>3</sup> Similarly, a complete inaction was observed on the front of preparation of DEMs and it was found out during audit scrutiny that despite the allocation of Rs 400 crores for preparation of DEMs covering 2.5 lakh square metres area in the Ganga basin, none of the sampled States sampled in the audit had prepared DEMs and Union Ministry couldn’t furnish the latest position in this regard. Out of the sampled States, West Bengal authorities stated that “preparation of DEMs for Flood Prone Areas was costly and time consuming” in the reply dated August 2016.

Replying to audit observation regarding DEMs, the Union Ministry stated during the exit meeting (December 2016) that the exorbitant costs charged by the National Remote Sensing Centre for high resolution DEMs is acting as deterrent in preparation of the detailed digital maps.

### **Morphological Studies**

Paragraph 10.3 of the National Water Policy (2012) and recommendation of 21<sup>st</sup> Parliamentary Standing Committee on Water Resources for 2013-14 envisaged preparation of detailed morphological studies of all the 301 rivers in 11 Ganga basin States. During performance audit, it was revealed that “CWC awarded work relating to morphological studies of only 15 rivers during 2015-16,” with a two year timeline for completion. CAG audit scrutiny also revealed that “out of these 15 rivers, morphological studies of only eight rivers (three per cent of total rivers in Ganga basin) were taken up.”<sup>4</sup>

### **Comprehensive Master Plans and Formation of Implementation Committees**

Performance audit also observed that comprehensive master plans (CMPs) were prepared by GFCC for all the 23 main tributaries of the Ganga. State governments in Ganga basin were to carry out Action Plans for implementation of recommendations contained in CMPs. However, CAG auditors observed that these details were not forthcoming from State governments. CAG auditors pointed out five main observations regarding preparation of CMP as follows:<sup>5</sup>

Out of 17 sampled States/UTs, 10 States (Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Manipur, Odisha, Punjab, Tamil Nadu and Uttarakhand) did not prepare CMP for flood management. Instead, these States prepared flood management projects on selective basis.

In Uttar Pradesh, CMP was prepared by the GFCC, however its recommendations were not implemented despite being one of the severely flood-affected States.

While formulating the Flood Management Programme schemes in West Bengal, major recommendations of GFCC were either not incorporated in the Detailed Project Report or were not implemented. Seven Flood Management Programme schemes falling in the Ganga basin revealed that important recommendations such as creation of natural detention basins, partial diversion of the flood water to the spill channels, watershed management, morphological studies etc. were not taken up.

In Arunachal Pradesh, though Brahmaputra Board had prepared the basinwise CMP, no action plan on the basis on the CMP was prepared by the State (as on June 2016).

Assam implemented only short-term schemes recommended in the CMP, but did not implement the long-term measures recommended in the Master Plan.

CAG auditors also noticed that while the Union Ministry requested (in February 2014) six severely flood-affected Ganga basin States (Bihar, Himachal Pradesh, Jharkhand, Uttarakhand, Uttar Pradesh and West Bengal) to constitute Implementation Committee to ensure time-bound implementation of the recommendations of the CMPs, only Uttar Pradesh had formed such a committee. However, the most shocking audit observation was that “no records relating to its meetings and progress achieved towards implementation of comprehensive plans were made available to audit.”

Similarly, CAG auditors also pointed out that large-scale flood disaster that Chennai had to witness during the South-West monsoon of 2015 was thanks to non-preparation of CMP for Chennai and its suburbs with reference to three rivers (as on August 2016). CAG of India carried out a comprehensive performance review of flood in Chennai and suburbs and this report was ready to enter the public domain in 2017. However, the Tamil Nadu government, for the reasons best known to them, delayed laying it in the assembly for more than a year. This comprehensive performance audit report has not got tabled and it remains to be seen if the Public Accounts Committee will take up the report for discussion without any further delay.

### **Flood Plan Zoning**

CWC had circulated a Model Bill on Flood Plain Zoning to all the States in 1975 for guidance of State governments for enactment of legislation that aimed to provide clauses about proposed flood zoning authorities, surveys and delineation of flood prone area, notification of limits of flood plains, prohibition or restriction of the use of flood plains, compensation and power to remove encroachments on the flood plains. Further the 21<sup>st</sup> Parliamentary Standing Committee on Water Resources recommended in 2013-14 that Union Ministry shall take vigorous steps for persuading the States to enact the necessary legislation on Flood Plan Zoning without delay.

However, during the performance audit in 2016, CAG auditors “observed that only three States (Manipur, Rajasthan and Uttarakhand) had enacted Flood Plain Zoning Acts.”

Audit also observed that “in Uttarakhand, Disaster Mitigation & Management Centre in 2012 had emphasized the need for banning

construction, especially in proximity of rivers and streams in lines with the provisions of the Uttarakhand Flood Plain Zoning Act, 2012.” The fact that this recommendation was not taken up in earnest became obvious since, “the Geological Investigation Report (2014) of DMMC, Uttarakhand and study report of Wadia Institute of Himalayan Geology (2014) attributed that most of the damages during the floods of June 2013 were due to construction and encroachments along the riverbeds and flood plain areas.”

### **Glacial Lake Outburst Floods and Landslide Dam Break Floods Studies**

Clause 10.7 of National Water Policy 2012 envisages that in order to increase preparedness for sudden and unexpected flood related disasters in hilly reaches, glacial lake outburst floods (GLOF) and landslide dam break floods studies with periodic monitoring.

Audit scrutiny revealed that the work of monitoring Glacial Lakes and Waterbodies in the Himalayan region was taken up by CWC in 2009. The inventory of Glacial Lakes and Waterbodies was prepared in 2011 based on satellite imageries taken in 2009. However, what is more shocking is that as against 2027 Glacial Lakes and Waterbodies with more than 10 hectares of water spread areas, CWC was monitoring only 477 Glacial Lakes and Waterbodies, having water spread area of more than 50 hectares during the monsoon season (June to October).

### **Flood Forecasting**

Performance audit revealed that “CWC has not established any Flood Forecasting Stations in 15 States/UTs, namely Andaman and Nicobar, Chandigarh, Daman and Diu, Goa, Himachal Pradesh, Kerala, Lakshadweep, Manipur, Meghalaya, Mizoram, Nagaland, Puducherry, Punjab, Rajasthan and Sikkim.”

Similarly, audit scrutiny revealed that “against a target for the XIIth Plan for installation of 219 telemetry stations, 310 base stations and 100 flood forecasting stations; only 56 telemetry stations had been installed as of August 2016.” Not only had CWC missed to achieve the target regarding flood forecasting stations, but CAG auditors also highlighted that “out of 375 telemetry stations, 222 numbers of telemetry stations were non-functional after installation and thus real time data was not available for the corresponding periods.”

### **Execution of Flood Management Programme**

CAG auditors also pointed out that “in eight out of 17 States/UTs, the flood management works were not taken up in an integrated manner covering the entire river/tributary or a major segment of rivers/tributaries.” Audit also pointed out huge delays in completion of Flood Management Programme works which ranged from 10 months to 13 years.

### **Absence of Emergency Action Plans (EAPs)/Disaster Management Plans (DMPs) for Large Dams**

CAG auditors raised an alarm over the likely impact of a dam burst with respect to large dams in India. The performance audit observed that “out of 4862 large dams, EAPs/DMPs of only 349 large dams had been prepared as on March 2016.” Further, the auditors found out that “only 231 large dams evolved operating manuals/ procedures.” A detailed scrutiny of records pertaining to management of large dams revealed that “out of 17 States/UTs, only two States had fully carried out pre and post-monsoon inspection of the dams, three States had carried out such inspections partially and remaining 12 States had not carried out such inspections.”

It has been more than a year since this performance audit report entered public domain. The monsoon of 2018 has already shown us devastating impacts of floods in different parts of the country. What we urgently require is a white paper from Public Accounts Committee on whether any lessons has been learnt from the severe indictment of the execution of Flood Management Programme and how have relevant agencies addressed the shortcomings and deficiencies pointed out by CAG auditors.

### **Notes**

- <sup>1</sup>. See, page 73 of the Performance Audit on Schemes for Flood Control and Flood Forecasting, (Report No 10 of 2017), CAG of India, New Delhi.
- <sup>2</sup>. See, page 75 and 76 of the Performance Audit on Schemes for Flood Control and Flood Forecasting, (Report No 10 of 2017), CAG of India, New Delhi.
- <sup>3</sup>. See, page 76 of the Performance Audit on Schemes for Flood Control and Flood Forecasting, (Report No 10 of 2017), CAG of India, New Delhi.
- <sup>4</sup>. See, page 77 of the Performance Audit on Schemes for Flood Control and Flood Forecasting, (Report No 10 of 2017), CAG of India, New Delhi.
- <sup>5</sup>. See, page 78 of the Performance Audit on Schemes for Flood Control and Flood Forecasting, (Report No 10 of 2017), CAG of India, New Delhi.