

# **Chapter 6**

## **Conclusion**



## Chapter 6: Conclusion

As per the Annual Flood Report - 2017 of Irrigation and Waterways Department, all the blocks under KMP and KKB were inundated by flood waters in July 2017. The flood damage reports of the Department of Disaster Management and Civil Defence, GoWB reflected loss of life, devastating damage to property and its adverse economic and environmental impacts.

### Flood damage data of 2017

| Population affected (Million) | Cropped area affected (M ha) | Damage to crops (₹ in crore) | Houses damaged (No.) | Damage to houses (₹ in crore) | Human lives lost (No.) | Cattle lost (No.) | Damage to public utilities (₹ in crore) | Total damages (₹ in crore) |
|-------------------------------|------------------------------|------------------------------|----------------------|-------------------------------|------------------------|-------------------|---|----------------------------|
| 8.723                         | 1.033                        | 6914.50                      | 8,26,982             | 9158.28                       | 217                    | 2,857             | 1655.16                                 | 17727.94                   |

(Source : Information disseminated by CWC vide No.3/38/2012-FFM/1067-1164 Dt 17 May 2019)

### Planning

- In the absence of basin-wise/river-wise holistic Master Plan, flood management projects were taken up at different locations depending on priority and availability of funds without being linked to a comprehensive plan.
- I&WD failed to adopt appropriate combination of structural and non-structural measures for effective management of floods. It only adopted some structural measures, which may not have been adequate to mitigate the impact of floods.

In this context the Department may need to:

- ✓ *Prepare comprehensive plan taking into account all existing developments with latest updated data, including the strategies recommended by various technical bodies, such as scientific assessment of flood prone areas, integrated basin management approach, etc.*
- ✓ *Adopt Engineering/Structural measures like detention basins, diversion of flood water, etc. which will not only reduce spilling but also bring relief to the flood prone areas by reducing flood flows and thereby the flood levels.*
- ✓ *Adopt Administrative/Non-structural measures like enactment of Model Flood Plain Zoning Bill which aim at demarcating zones or areas likely to be affected by floods of different magnitudes, frequencies, probability levels and specify the types of permissible developments in these zones, so that whenever floods actually occur, the damage can be minimized.*

### Implementation

- The two Flood Management Programmes (FMP) :- Kandi Master Plan (KMP) and Kaliaghai-Kapaleswari-Baghai Plan (KKB) executed by I&WD during the years 2013-18 suffered from various deficiencies such as defective DPRs with incomplete estimates. There were also deviations from the approved DPR and non-compliance with Indian Standard Codes and GFCC recommendations.
- KMP, which as per the DPR was to be completed by March 2017 was delayed and is still ongoing (August 2019). Only raising and strengthening of embankments of different rivers was carried out by I&WD, while it failed to create the additional waterways by reconstructing/renovating bridges and culverts to ensure proper drainage of the basin water. As per the Flood Report of 2017, all the four blocks included under KMP were

inundated by flood waters in July 2017. The flood protection measures taken by I&WD may, therefore, not have been adequate.

- Commencement of the KKB project without ensuring acquisition of land, grossly hampered execution of works leading to delay in completion of the project, which is still ongoing (August 2019). Rivers/khals were not widened/excavated up to design bed width, which implied that with the limited carrying capacity, they would not be able to control frequent flooding in the areas. Inclusion of non-feasible items, non-construction of regulator at the confluence of river Kapaleswari and Kaliaghai and non-maintenance of already resuscitated rivers/khals caused heavy siltation affecting the overall drainage system of the project. According to the Flood Report of 2017 all the seven blocks included under KKB were inundated in 2017. The flood protection measures taken by I&WD may, therefore, not have been adequate.
- In addition to the above two projects, the various embankment protection and anti-erosion of river bank works undertaken during the period did not meet the prescribed standards. Failure to provide the required thickness of graded filter below the revetment, non-provision of the required sand cushion layer in the embankment and use of below specification GI wires in boulder crates for construction of embankment resulted in not providing the required relief from flood problem in the areas. Besides, there was wasteful, avoidable extra expenditure and delay in execution of works.

In view of these deficiencies in implementation the Department needs to:

- ✓ ***Prepare DPRs in accordance with prescribed standards and guidelines and adhere strictly to the approved DPR while implementing the flood control programmes.***

### **Financial Management**

- Savings with respect to Budget Estimates as well as Revised Estimates ranged from 26 to 68 *per cent* and 14 to 34 *per cent*, respectively. Yearly budgets were prepared by I&WD without inputs from the divisional level, which resulted in such savings.
- As per the Budget Publications, I&WD could not spend ₹ 1099.45 crore during 2013-14 to 2017-18, though provision of funds were made through REs by the State Government. Despite availability of funds, 2162 sq. km. of the total flood prone area of the State remained unprotected as per the Annual Flood Report 2017 of I&WD.
- There were irregularities in the use of the FMP funds. Under KKB project, Central funds of Rs 6.87 crore were used for urgent maintenance and repair of three roads contrary to scheme, guidelines, royalty amount of Rs 69.05 lakh was not deducted from contractors bills for failure to submit royalty payment certificates and security deposits were refunded to contractors in violation of tender clauses.

In view of such deficient financial management, the Department may:

- ✓ ***Take inputs from all Divisions for preparation of budget and ensure optimum utilisation of allotted funds.***

### **Quality Control and Monitoring**

- I&WD did not ensure the quality of cement used in works. The onus of I&WD in ensuring the quality of the earthen embankments constructed appeared to


be lacking. Tests for determining Specific Gravity of the boulders used were not done. These could impact the structural design causing defects leading to failure of the works impacting flood control measures.

- Progress of the work was not monitored effectively. Both the projects, KMP and KKB were delayed and vulnerable areas remained prone to floods. Monitoring physical progress of the schemes through remote sensing techniques stipulated by the FMP guidelines was not adopted for any schemes of Flood Control during the years 2013-18. Inadequate monitoring system also negated the scope to take corrective action while work was in progress.
- Due to inadequate number of gauge stations, the water level recording mechanism in the sub-basins of Tangon river, Kalindri river, Punarbhaba river and Pagla river was weak.

There is no system of real time compilation and dissemination of flood data by I&WD. This is an important and integral part of a flood warning service, which can help to provide adequate lead time for the public and reduce flood damages. In view of these the Department may consider:

- ✓ *Introduction of Remote Sensing techniques for monitoring of physical progress of the schemes in Flood Management Works.*
- ✓ *To ensure real time compilation and dissemination of flood data, provide more river gauge stations to measure the level of water at different locations and warning mechanism which will provide timely flood warnings with adequate lead time for the public to minimise the flood damages.*

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