

August 19, 2018
Alappuzha District



CHAPTER II PLANNING AND CAPACITY BUILDING

The Disaster Management Act (DM Act) enacted by Parliament in 2005 envisages a continuous and integrated process of planning, coordinating and implementing measures for disaster management. The Act stipulated that a State Authority shall be vested with the responsibility for laying down policies and plans for disaster management in a State. In Kerala, at the district level, District Disaster Management Authorities were also constituted in September 2008 following the constitution of the State Disaster Management Authority. The KSDMA assisted by the State Executive Committee, is responsible for measures to be taken for mitigation, capacity building and preparedness by the various departments and to issue such guidelines as may be necessary.

Planning

2.1. Inadequate provision for flood management in the State Water Policy

The Government of India formulated a National Water Policy (NWP) in 1987 which was revised in 2002 and subsequently in 2012. The NWP envisaged and included provisions relating to the management of flood. The NWP 2002 envisaged that States would formulate a Master Plan for flood control and management for each flood prone basin, and provide for adequate flood-cushion in water storage projects as well as strict regulation of settlements and economic activity in the flood plain zones to minimise the loss of life and property on account of floods. The NWP 2012 required operating procedures for reservoirs to be evolved and implemented in such a manner so as to have flood cushion and to reduce trapping of sediment during flood season. It also mentions that encroachments and diversion of water bodies must not be allowed and restoration must be promoted to the extent feasible. NWP 2012 envisages the drafting of State Water Policy (SWP) in accordance with NWP keeping in mind the basic concerns and principles as also a unified national perspective.

Audit observed that as against the NWP, the Kerala SWP, as formulated by the Water Resources Department (July 2008) did not consider the aspect of management of floods in the State. The provisions in the Water Policy of GoI which placed emphasis on preparedness for flood, modernisation of flood forecasting using real time data acquisition system linked to forecasting model⁶, evolving and implementing operating procedures for reservoirs in order to have flood cushion, increasing preparedness for sudden and unexpected floods were not included in the Water Policy formulated by GoK. During the course of the Performance Audit, Audit came across issues⁷ such as

⁶ Paragraphs 17.2, 17.3, 17.4 and 17.5 of the NWP 2002

⁷ Paragraphs 2.3, 3.3 and 3.7 and **Appendix 2.1** of this Report

the absence of legislation to demarcate flood plains, encroachment of water bodies, absence of flood forecasting stations, inadequate desiltation activities etc. Non-inclusion of elements of flood control measures in the State Water Policy was indicative of the relative low priority given to flood management issues possibly because Kerala was not considered a flood prone State until recent years.

The Department of Water Resources replied (November 2020 and April 2021) that though the SWP 2008 does not explicitly provide for flood management/forecasting, the Department had given emphasis to flood preparedness/forecasting in the past and 131 rain gauges, 54 river gauge stations and nine fully automatic climatic stations had become operational prior to the floods of 2018. In order to equip the State to contain disasters of similar magnitude as that which took place owing to the unprecedented heavy rainfall, after the 2018 floods, the Government resolved to develop a full-fledged inflow forecasting and flood early warning system under the National Hydrology Project in all river basins with real time monitoring through tipping bucket rain gauge (99 nos.), radar level sensor (56 nos.) and automatic weather stations (13 nos.). Orders have been issued to develop a single authoritative platform Kerala Water Resources Information System for all water resources related information. The Department stated that these facts indicate that the Government had a functional mechanism with respect to flood forecasting and was quick to formulate measures for real time flood forecasting in the wake of the after effects of 2018 floods. The reply also indicated that a drafting Committee was constituted in November 2017 for formulating a revised SWP, which was reconstituted in January 2021 and the Committee submitted a revised draft of the amended SWP on 05 April 2021. Revised State Water Policy containing the provisions for flood management based on State specific requirements would be promulgated when the new Government comes to power.

The response of the Department confirms the inadequacy of provisions relating to flood management in SWP as depicted in the audit paragraph.

Recommendation 2.1: Government of Kerala may consider revision of the State Water Policy to include aspects relating to flood management, in line with the National Water Policy and after considering the specific requirements of the State.

2.2. Non-preparation of State level Master Plan for water resources development and management

The State Water Policy (SWP) 2008 considered the micro watershed as the basic unit and the river basin as an integrated unit of micro-watersheds. It envisaged preparation of a State level Master Plan for water resources development and management by compiling the status and action plans in each micro watershed, sub-basins and river basins in a hierarchical form. Additionally, Master Plans for the major rivers of the State were to be prepared which would form the basis of any river-based project. A State Level

River Authority was also to be constituted for coordinating all water related activities at the river basin level. A GoI report of the National Commission on Flood had observed as early as in March 1980 that the practice of undertaking flood schemes on *ad hoc* basis was unscientific and recognised an urgent need for preparing basin-wise Master Plans which would indicate priority of schemes for implementation.

Audit noted that a State Level River Management Authority was yet to be constituted. Non-constitution of the same meant absence of an institutional mechanism for ensuring co-ordination between different implementing agencies and for monitoring prioritisation of works undertaken. The canal work in Cochin International Airport Limited (refer Paragraph 4.3 of this Report) is an example of a case where the State Level River Management Authority could have monitored the prioritisation of the works to be undertaken to prevent inundation of the airport and areas in the vicinity during the floods of 2018.

Audit further observed that during 2014-19, the Irrigation Department of GoK expended ₹178.99 crore for flood control/ mitigation works in the State including 273 works at a cost of ₹55.17 crore in the test-checked districts of Thrissur, Idukki, Ernakulam and Alappuzha. Works were also executed under the River Management Fund, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme, Kuttanad Development Scheme and Project Management works. These works were taken up at different locations, based on the requests from local people, people’s representatives and local bodies without being linked to a comprehensive plan for the management of floods. In the test-checked districts, Audit noticed that no survey or investigation was conducted to identify the flood prone/ vulnerable areas for prioritising the works to be undertaken.

Audit was informed (March 2020) that the Master Plan of only one river⁸ viz. Chaliyar besides two⁹ of the five tributaries of the Bharathapuzha River had been completed. Thus, Master Plans of 42 out of 44 rivers are yet to be prepared though envisaged in the State Water Policy. Non-availability of Master Plans for the major rivers of the State implies scope for inclusion of flood control works on *ad hoc* basis.

GoK stated (March 2020) that micro watershed plans containing details of traditional water bodies such as ponds, lakes, streams and springs were prepared at Grama and Block Panchayat level under ‘Haritha Kerala Mission’. However, the fact remains that a State level Master Plan for water resources development and management as envisaged in the SWP is yet to be prepared.

During the Exit conference (February 2021), Additional Chief Secretary, Water Resources Department stated that a draft bill had been finalised for constitution of River Basin Conservation and Management Authority. The Department also informed (April 2021) that when the model code of conduct

⁸ Out of 44 major rivers in Kerala

⁹ Gayatriputzha and Thoothapuzha

is lifted, the bill is expected to be passed as an ordinance. As per the State Water Policy 2008, preparation of State level Master Plan for water resources development and management is to be a combined effort of various stakeholder departments and the formulation of the same is progressing under the authority of Town and Country Planning Department. With respect to the preparation of master plans for major rivers in the State, priority will be given to those rivers that are prone to flood and passing through densely populated areas viz. Periyar, Chalakkudy, Pamba, Meenachil, Muvattupuzha, Karamana, Bharathapuzha and Chaliyar rivers.

Recommendation 2.2: Government may ensure compliance with the provisions of the Kerala State Water Policy such as formulation of a State level Master Plan for water resources development and management, formulation of Master Plans for the major rivers besides constituting a State Level Authority to coordinate all water related activities at the river basin level.

2.3. Non-enactment of legislation to identify and demarcate Flood Plains in the State

Flood plain zoning is a concept central to flood plain management. This concept recognises the fact that the flood plain of a river is essentially its domain and any intrusion into or developmental activity therein must recognise the river's 'right of way'¹⁰. Flood plain zoning measures aim at demarcating zones or areas likely to be affected by floods of different magnitudes or frequencies and probability levels, and specify the types of permissible developments in these zones, so that whenever floods actually occur, the damage can be minimised, if not avoided. A model draft bill for flood plain zoning legislation was circulated by the Union Government in 1975 to all the States. The proposed legislation envisaged creation of a Flood Zoning Authority, survey of flood plains and prohibition or restriction in the use of these lands. The National Disaster Management Authority's (NDMA) guideline on 'management of floods' also has a section on enforcement and regulation related to flood plain zoning.

The State of Kerala has not enacted flood plain zoning legislation and the flood plains of the State have not been identified and demarcated. Had the exercise of identification and demarcation of the flood plains been undertaken, the same could have been used by GoK in their activities on flood control.

The Department of Water Resources replied (November 2020) that the State of Kerala had informed (2013) the Ministry of Water Resources and Ganga Rejuvenation about the practical difficulties and limitations of enacting the flood plain zoning legislation in Kerala. It added that the topography of Kerala was unique when compared with the States that had implemented the legislation.

¹⁰ Source: Planning Commission, GoI, Report of Working Group on Flood Management and region-specific issues for XII Plan (2011).

However, Audit observes that while there may be challenges in implementing such a legislation as envisaged for flood plain zoning, it should not become an absolute deterrent to even initiate a process of identification of the flood plain zones for the 44 major rivers as well as the level of urbanisation and development activities. As per the NDMA Guidelines also, flood plain zoning is necessary to minimise damage in the case of floods by rivers. According to Kerala State Disaster Management Plan, 2016, flood plains are flood prone and hazardous if developmental activities in them exceed an acceptable level. It further states that reclamation and settlement in flood plain areas is a major cause of flood damage in the State. Further, during the course of audit, 913 encroachments of water bodies were noticed in the selected districts as detailed in **Appendix 2.1**. Legislation to identify and demarcate flood plain zones of the State would enable the Government to take proactive measures in controlling potential encroachment activities in the flood plains.

The Department replied (April 2021) that in India, only three States namely Manipur, Rajasthan and Uttarakhand had enacted the legislation as of December 2016. Kerala had never been considered as a major flood prone State till the flood of 2018 unlike the States located in Indo Gangetic plain. The States located on the banks of Ganges, Yamuna and Brahmaputra basins are yet to enact the Flood Plain Zoning Bill. Flood plain zoning needs institutional support and interdepartmental coordination. Though Kerala has an undulating topography and a high population density, Government recognises it is a vital tool in preventing flood. Feasibility study on enacting the Flood Plain Zoning Bill in the State would be conducted when the new Government comes to power.

Audit noticed that the need to prevent encroachments along rivers and flood plains was again emphasised in the draft River Regulation Zone notification, 2016, under the Environment (Protection) Act, 1986 which was circulated to the States by the Ministry of Environment, Forests, and Climate change (MoEFCC). The notification proposes to declare river stretches and flood plain zones as river conservation zones and to regulate or prohibit developmental activities in these zones. Further, though the Coastal Regulation Zone Notification of January 2011 (as amended in 2019) envisages that coastal land from High Tide Line upto 50 m¹¹ on the landward side along rivers subject to tidal influence fall under the coastal regulation zone and would be regulated as per the provisions of the Act, this would not suffice to check encroachments, as flood plains of only some rivers/stretchers of rivers in some districts are covered under the CR Zones.

Flood plains and river beds are some of the natural features that allow absorption of heavy rainfall or a river's overflow and facilitate mitigation of adverse effects, hence permitting uncontrolled constructions and encroachments, particularly in an era of climate change could be extremely short-sighted. Recognising the river's right to expand and contract over seasons is vital. Notwithstanding the practical difficulties in implementing

¹¹ 100 m upto 17 January 2019

flood plain zoning legislation/ regulation in a densely populated State like Kerala, the Government needs to ensure through active stakeholder engagement that this gap in the regulatory framework is not allowed to persist.

Recommendation 2.3: Government of Kerala may initiate action for a legislation/regulation on flood plain zoning, as well as constitute an Authority to identify and demarcate flood plain zones of the State and to prohibit or restrict the use of these lands.

2.4. Flood Hazard Map not conforming to criteria

Flood Hazard Mapping is a vital component to facilitate the identification of areas at risk of flooding and also helps to prioritise mitigation and response efforts¹².

An Expert Committee constituted by GoI¹³ for scientific assessment of flood prone areas in India defined (June 2013) flood prone areas as such areas affected by floods which have a return period of 10 years *viz.* probability of its recurrence and emphasised that the return period of flood would be one of the important criteria for classification of flood prone areas. Flood prone areas were to be initially categorised as Severe, Moderate and Normal. Methodology for identifying these areas as such were also detailed by the Expert Committee. The Expert Committee recommended that each State should set up a Regional Committee which, among other things, would be responsible for delineating flood prone areas of the State based on methodology finalised by it. The State was bound to follow the procedures laid down by the Expert Committee. In line with GoI recommendations, GoK constituted¹⁴ (October 2014) a Regional Committee to identify, demarcate and classify the flood prone areas in Kerala.

GoK formulated a Kerala State Disaster Management Plan approved by the SEC and KSDMA (September 2016) which was intended to be an ever-evolving document formulated under the Disaster Management Act 2005. Audit noticed that the map adopted by GoK and incorporated in the Kerala State Disaster Management Plan 2016 was prepared (2010) by the National Centre for Earth Science Studies (NCESS)¹⁵ in 1:50,000 scale using satellite images. Though Central Water Commission (CWC) in June 2013 had fixed the return period of flood as the criteria for identifying flood prone areas, GoK continues to rely upon a flood prone area map prepared in 2010 which does not adhere to the criteria fixed by CWC for earmarking an area as flood prone.

The inadequacy of the maps adopted in the DM Plan was evident from the reply of NCESS to Audit (July 2019) that large scale maps would be required for application at the local level. The need for integrating field mapping, high resolution satellite images and Digital Elevation Models for generation of database for local level application was also emphasised by NCESS.

¹² Source: Flood Hazard Atlas of Odisha prepared by National Remote Sensing Centre, GoI

¹³ Ministry of Water Resources, Central Water Commission

¹⁴ Additional Chief Secretary, Water Resources Department as Chairman, Chief Engineer, CWC Coimbatore as Member Secretary, Secretary, KSDMA as member and two other members

¹⁵ NCESS – formerly known as Centre for Earth Science Studies

Thus, flood susceptibility map of NCESS as adopted by GoK in its Disaster Management Plan needs to be revisited in order to make it useful for local level applicability.

Audit observed that the Regional Committee¹⁶ constituted (October 2014) to identify, demarcate and classify the flood prone areas in Kerala by July 2015 met only twice during 2014-19 and could not achieve its stated objective.

GoK in its response stated that

- the flood susceptibility map was prepared by the State in 2010 when the Expert Committee's recommended methodology was not available. It is not meant to be a substitute for the large scale Flood Hazard map required to be prepared (in accordance with the methodology prescribed by the Expert Committee) and provided by the Ministry of Water Resources, National Remote Sensing Centre, Survey of India and Central Water Commission as notified in the Disaster Management Plan of 2016 and the National Disaster Management Guidelines-Management of Floods 2008, which when obtained, would be incorporated in the State Disaster Management Plan.
- The Department said that CWC informed (May 2020) that there was not much progress in the matter of large-scale flood mapping due to non-availability of high-resolution digital elevation models for the States. Thus, the delay in identification, demarcation and classification of flood prone areas cannot be attributed to the State Government.
- In the Exit Conference (18 January 2021) Member Secretary, KSDMA stated that the NCESS map adopted in the State DM Plan 2016 had an accuracy of 70 *per cent* which was sufficient for all planning purposes.

The reply of the Government confirms the audit observation that the State is yet to have a large-scale flood hazard map satisfying the criteria, even though the flood hazard map is a vital component for identification of risk prone areas and to prioritise response efforts. Though seven years have elapsed since the methodology was prescribed for preparation of flood prone map, the State is still dependent on the 2010 map.

Audit observed that United Nations Development Programme in its Post Disaster Needs Assessment document¹⁷ (released after the Kerala floods of 2018) referring to the available map notes that the same has been prepared at a scale of 1:50,000 while indicating that this has resulted in awareness among

¹⁶ Based on the recommendations of Expert Committee for Scientific Assessment of Flood Prone Areas in India, Government of Kerala constituted (October 2014) a Regional Committee with Additional Chief Secretary, Water Resources Department as Chairman to identify, demarcate and classify the flood prone areas in Kerala.

¹⁷ Commissioned by the Kerala Government, the Kerala PDNA was undertaken jointly by experts from the line Ministries and the United Nations.

the citizens about hazards and environmental conservation, these maps should ideally be prepared at a scale of 1:10,000 or 1:5000 if they are to be useful for planning and policy making. Accordingly, the contention raised in the Exit Conference that this map is sufficient for planning is not acceptable because the map does not meet the criteria set by CWC and also since NCESS, which created this map had informed Audit that the map is insufficient.

Recommendation 2.4: Government of Kerala may take steps to ensure availability of large scale flood hazard maps conforming to CWC criteria which would facilitate planning, policy making and prioritisation of flood mitigation activities by identifying flood risk areas.

Capacity Building in Disaster Management

2.5. Implementation of Civil Defence in the State

The Disaster Management Act envisages requisite institutional mechanisms to promote general education, awareness and community training in regard to forms of disasters to which different parts of the State are vulnerable and the measures that may be taken by such community to prevent the disaster, mitigate and respond to such disaster. In order to create a mechanism for efficient and effective response to any natural or manmade emergency, a sizable trained volunteer force of emergency responders at the grassroots level needs to be made available as standby in all vulnerable urban/ rural areas¹⁸. Accordingly, amendment was enacted (2009) to the definition of “civil defence” contained in the Civil Defence Act, 1968 so as to bring within its scope the measures which may be taken for the purpose of disaster management during, at, before, or after any disaster. Since the community was invariably the first responder to any disaster, adequate awareness and preparedness of the community to respond to any such emergency/ disaster would be very crucial in mitigating the damage and suffering.

In Kerala, the post of Director of Fire Force was redesignated (October 1980) as the Commandant General (Home Guards, Civil Defence and Fire Services). However, Civil Defence was officially formed in the State under the Fire and Rescue Services Department only on 30 August 2019. Consequently, the implementation of three schemes launched by GoI during 2009-2016 to strengthen civil defence in the State viz., ‘Revamping of Civil Defence’, ‘Mainstreaming Civil Defence in Disaster Risk Reduction’ and the ‘Aapda Mitra’ scheme suffered setbacks. An amount of ₹4.43 crore was released by GoI during the period towards implementation of these schemes, which could not also be effectively utilised. Audit noticed that due to non-formation of Civil Defence in the State, little headway was made in implementing these schemes meant to ensure the availability of an active volunteer-based

¹⁸ Suggestions of K. M. Singh (Member NDMA) Committee to integrate Civil Defence in Disaster Management framework, endorsed by Home Minister’s Civil Defence Advisory Committee in April 2008

emergency force for disaster mitigation. The following three paragraphs highlight the issues observed by Audit.

2.5.1. Unfruitful expenditure of ₹1.54 crore on construction of Civil Defence Training Institute



*Figure 2.1: Civil Defence Training Institute Building
29 October 2019, CDTI, Viyyur, Thrissur District
Photo taken by Audit party, attested by Director, Fire and
Rescue Services Academy*

Audit observed that under the scheme ‘Revamping of Civil Defence’ launched by GoI in July 2009, ₹154.20 lakh out of ₹195 lakh received from GoI was expended on construction of a Civil Defence Training Institute (CDTI) at Viyyur in Thrissur district. Joint field verification (October 2019) revealed that though the building, completed in 2014,

was envisaged to function as a State level residential training institute for civil defence under the Fire and Rescue Services Department (F&RSD), it was being utilised as a camping place for members of the National Disaster Response Force (NDRF), with the classrooms and dormitory converted as barracks. Audit observed that the building which was in possession of Revenue Department till April 2018, was handed over to F&RSD on the pre-condition that the NDRF battalion was to be accommodated in the building until a new own building was identified. Joint verification (October 2019) revealed that possession of only a small room had in fact been transferred to the Director



*Figure 2.2: CDTI being used as barracks for NDRF battalion
and materials being stored in lobby
29 October 2019, CDTI, Viyyur, Thrissur District
Photo taken by Audit party, attested by Director, Fire and
Rescue Services Academy*

of CDTI, which was used for office functioning, with the rest of the building continuing to be occupied by NDRF. The residential training centre to impart training to civil defence volunteers has not become functional despite passage of over five years. Had the State rolled out Civil Defence, selected the volunteers and trained them in a timely manner, the CDTI building could have catered to the envisaged objective.

Audit had previously pointed out¹⁹ the non-functioning of CDTI due to delay in creation of posts and purchase of equipment, to which GoK replied (November 2016) that the responsibility to activate CDTI has been entrusted to KSDMA. The reply offered by GoK in November 2020 was that the temporary pre-positioning of NDRF team in the building facilitated judicious utilisation of an otherwise idling building. It was also stated that there was adequate facility in the Fire and Rescue Services Academy to provide captive training to Civil Defence Volunteers and in-service men. The reply is contrary to facts as it was the responsibility of KSDMA to activate CDTI building so as to cater to the dedicated purpose of a full-time residential training institute for civil defence, which remains unrealised. Further, DG, F&RS stated (December 2020) that as a variety of training schedules²⁰ were being conducted in Fire and Rescue Services Academy, it was essential to allot maximum space for the residential training of civil defence volunteers at CDTI. On pointing this out in Exit Conference (January 2021), GoK stated that though allocations were made for construction of CDTI and DG, F&RS designated as Director General (Civil Defence), Civil Defence was not notified in the State until 2019. For this reason, even if a building was constructed there, no training would have happened and the scenario of State's flood response would not have changed. The reply reveals the low priority given to the formation of Civil Defence and for equipping the volunteers as emergency responders in crisis situations. Despite designating Director of Fire Force as the Head of Civil Defence as early as in October 1980, the State was left without any civil defence volunteers for the past 38 years.

During the Exit Conference, Audit was informed that, now that a separate piece of land has been allotted to NDRF for constructing their own building and Civil Defence has been formed, NDRF would move out soon. In view of the idling of existing infrastructure provided for training in the past years and construction of new building not having commenced yet, the possibility of NDRF moving out and the entire building of CDTI being utilised for Civil Defence related trainings in the near future remains doubtful.

2.5.2. Mainstreaming Civil Defence in Disaster Risk Reduction

Government of India scheme 'Mainstreaming Civil Defence in Disaster Risk Reduction' for strengthening the Civil Defence setup in the Most Vulnerable Districts/ Multi Hazard Districts envisaged creating a response system based on minimum permanent staff backed by skilled volunteers. Six²¹ districts in Kerala were classified (2014) as 'Most Vulnerable'. Ministry of Home Affairs released (November 2014) ₹225.52 lakh as first instalment of grant-in-aid to the State for the financial year 2014-15. This included ₹198.52 lakh for the six most vulnerable districts and ₹27 lakh to the CDTI envisaged under the scheme 'Revamping of Civil Defence'. Audit observed that the entire ₹225.52

¹⁹ Paragraph 4.4.6.1 of the Audit Report of Comptroller and Auditor General of India for the year ended March 2016, currently under consideration of PAC.

²⁰ Station officer course, Driver Mechanic course, Fireman course etc.

²¹ Ernakulam, Kannur, Kottayam, Kozhikode, Thiruvananthapuram and Wayanad

lakh received in November 2014 was retained by the Finance Department until March 2017, when it was provided in the budget as Supplementary demand for grants, as proposed by the Revenue Department. As the Director General of Civil Defence did not receive the money, the scheme could not be implemented and the amount was resumed by GoK in June 2017 without any further disbursement. Thus, GoI assistance of ₹225.52 lakh for strengthening of Civil Defence set up in the State could not be utilised for the envisaged purpose. GoK replied that a request has been made (November 2020) to Home Department to revalidate the amount for implementation of the scheme by F&RSD.

2.5.3. Slow pace of implementation of Aapda Mitra Scheme

National Disaster Management Authority (NDMA) approved ‘Aapda Mitra’, a 100 *per cent* Centrally Sponsored Scheme, with focus on training 6000 community volunteers in disaster response in the 30 most flood prone districts (200 volunteers per district) in India. This was to bestow them with skills needed to respond to the immediate needs of their community and undertake basic relief and rescue tasks during emergency situations such as floods, flash floods and urban flooding. In Kerala, Kottayam district was selected for implementation of the scheme. Consequent upon signing (November 2016) of MOU of two-year validity with KSDMA, NDMA released ₹22.70 lakh²² to GoK in February 2017.

Audit observed that while more than half of the beneficiary States²³ had completed the selection of volunteers and were about to commence training for volunteers in 2017 itself, KSDMA forwarded the list of selected volunteers from Kottayam district to NDMA only in February 2018. Verification of records at F&RSD and KSDMA showed that though the allotted funds were resumed in February 2018, GoK released the amount subsequently to KSDMA in June 2018 and KSDMA arranged training to 200 enlisted volunteers from Kottayam from October 2018 to March 2019. Thus, the services of the envisaged trained team of community volunteers were not available during the floods of August 2018.

Audit further observed that the emergency responder kits²⁴ to the trained volunteers were distributed by KSDMA only in December 2019, one year after the completion of training of the first batch of volunteers. Purchase of emergency stockpile²⁵ was still under process (May 2020).

²² 50 *per cent* of the sanctioned amount

²³ Andhra Pradesh, Delhi, Gujarat, Himachal Pradesh, Karnataka, Manipur, Meghalaya, Nagaland, Punjab, Tamil Nadu, Tripura, Bihar, Uttarakhand and West Bengal as per the information provided by NDMA in March 2021.

²⁴ Kits comprising Life Jacket, Solar Torch, Safety gloves, Nylon rope, Pocket knife, First Aid Kit, Rain coat, Water bottle etc.

²⁵ Stockpile consisting of Personal Floatation device, Torch, Safety Gloves, Rope, Lifebuoy, Oars, Paddles, Anchors, Bailer, OB Motor, Fire Extinguisher, Emergency Spotlight, Stretcher, Tool Kit, Walkie-talkie, first aid kits, GPS sets etc.

The Department of Revenue and Disaster Management replied (November 2020) that

- While the project was launched in November 2016, the modalities for implementation were briefed in the National Technical Committee meeting on 01 April 2017 following which the first meeting of the State Project Steering Committee was held on 31 August 2017 in which public notice for the scheme was handed over to DDMA Kottayam for circulation. The scheme was formally inaugurated on 13 October 2017.
- Owing to adverse ways and means position, the first instalment of ₹22.70 lakh allotted to KSDMA vide GO dated 14 March 2018 was not released and after allotment in 2018-19, the amount was finally credited to KSDMA account in June 2018, after which alone activities such as printing of training modules, training of volunteers etc. could be taken up.
- Fire and Rescue Services Academy was approved as the training Academy by NDMA on 08 June 2018.
- The catastrophic floods of August 2018 rendered the entire operational machinery out of gear and KSDMA being in the vanguard of the Disaster Management activities could not provide attention to other matters.
- The second instalment of ₹22.70 lakh was allotted vide GO dated 21 December 2019. Despite the delay in receipt of funds, KSDMA managed to supply the emergency responder kits in December 2019 itself.
- GeM portal through which emergency responder kits were purchased had many glitches and required frequent communication with GeM portal managers for rectification. Samples of each item had to be purchased first to get assurance of quality and this took time.
- KSDMA has organised various programmes to ensure continued participation of volunteers in the mission 'towards safe state'. Exposure and orientation programme (29 January 2019), training on Civil Defence (10 December 2019), annual refresher training for volunteers (09 to 12 July 2019), meeting with Unit Coordinators (13 November 2019) were conducted.
- The State is considered by NDMA as a model State in the implementation of Aapda Mitra scheme. NDMA decided to conduct the national review meeting in Kerala in 2020 to demonstrate the achievements of Aapda Mitra in Kottayam district.
- Further, Government of India has extended (July 2020) the project till 31 December 2020 as most States could not complete the programme owing to local implementation difficulties.

- Training by Fire and Rescue Services Academy commenced on 22 October 2018 after the floods of 2018 (meant for 200 volunteers in batches of 25) on specific dates. Many volunteers dropped out citing personal and livelihood reasons, captive nature and length of training etc. Aapda Mitra being a voluntary capacity building programme, there is no legal provision to demand work from volunteers who render work voluntarily based on request.
- The programme was successful in Kerala as owing to the pragmatic approach of NDMA, KSDMA and the DDMA, they were able to impart a spirit of voluntarism in the participants.

During the Exit Conference, it was added that the scheme deadline has been extended to March 2021.

Audit noticed that subsequent to signing of MoU of Aapda Mitra Scheme in November 2016, procedural delay at various individual stages²⁶ resulted in distribution of emergency responder kits in December 2019, one year after completion (October 2018) of training of the first batch of Aapda Mitra volunteers. Thus, the disaster response skills acquired by the volunteers were yet to be supplemented with vital equipment for basic relief and rescue and coordinated under the Aapda Mitra scheme for the benefit of the local community, despite another severe flood having affected the State in August 2019. The justification of Government that the extension of the project (July 2020) till 31 December 2020 (and subsequently till 31 March 2021) by GoI due to the fact that most States could not complete the programme owing to local implementation difficulties is not acceptable as a reason for justifying the slow pace in Kerala which has a higher degree of disaster risks as compared to the rest of the country (Paragraph 1.2 of Kerala State Disaster Management Plan 2016) and more so when there was only one selected district (Kottayam) as part of the programme. Further, it was seen that the list forwarded to KSDMA was taken directly from the Community Rescue Volunteer Scheme list in Kottayam by the DDMA. Being readily available, this could have been forwarded much earlier than February 2018 to NDMA, had the level of preparedness been higher.

Though it was stated that the F&RS Academy was approved by NDMA as the training Academy in June 2018 only, as pointed out in Paragraph 2.5.1 of this report, the State had a Civil Defence Training Institute right from 2014, which if utilised as a dedicated training institute, could have catered to the training needs of Aapda Mitra too. Further, DG (F&RS), had earlier requested (November 2017) Revenue and Disaster Management Department to handover the CDTI building and premises urgently for conducting trainings of Aapda Mitra/ Community Rescue Volunteer Scheme.

²⁶ First meeting of the State Project Steering Committee took place five months after the National Technical Committee meeting, hence request for list of volunteers was sent only in August 2017 by KSDMA, list forwarded by DDMA Kottayam received by KSDMA in November 2017 was forwarded to NDMA only in February 2018, release of funds by GoK in June 2018 and of second instalment by December 2019.

Though the reply mentioned (November 2020) that the State has been considered by NDMA as a model State in the implementation of Aapda Mitra scheme and that NDMA even decided to conduct the national review meeting in Kerala in 2020 to demonstrate the achievements in Kottayam district, Audit noted that the document forwarded in support of the 'national review' meeting in fact pertained to a 'regional assessment' workshop and the contention of Kerala being a model State in Aapda Mitra was not supported by documents.

Recommendation 2.5: The State may initiate action to operationalise the Civil Defence Training Institute for the fulfilment of the intended objective of training and equipping sufficient number of Civil Defence volunteers. Civil Defence needs to be strengthened in the State through ensuring a) adequacy of communication facilities and trained volunteers including availability of licensed HAM radio operators, and b) availability of emergency responder kits to enable timely and effective rescue operation during emergency/ disaster situations.

2.6. Revamping of Kerala Fire and Rescue Services Academy

The Director General (Fire and Rescue Services) (DG) requested Government of Kerala (August 2016) to allot ₹98.25 lakh²⁷ from the savings of the 13th Finance Commission grant-in-aid for revamping F&RS Academy at Viyyur, Thrissur. The proposal included procurement of vital equipment for rescue operation during flood such as Self-Contained Underwater Breathing Apparatus (SCUBA) Set (₹26 lakh), Breathing Air Compressor (₹ six lakh) etc. Accordingly, GoK accorded Administrative sanction (September 2016) for the proposal and the funds were credited by KSDMA to the treasury account of DG (F&RS) in March 2017.

Audit observed from scrutiny of records at the F&RSD that the funds remained idle with F&RSD until March 2018, when these were resumed by GoK. Further examination revealed that though tenders were invited (May-June 2018) by F&RSD for the purchase of requisite items in 2018-19, these had to be cancelled (August 2018) as the funds were already revoked by GoK. Nevertheless, even without obtaining Utilisation Certificates from F&RSD, KSDMA recorded the entire amount resumed by GoK as expenditure for the year 2016-17.

Joint physical verification conducted by Audit along with Assistant Director, F&RS Academy (October 2019) revealed severe shortage of equipment, vehicles and infrastructural facilities (**Appendix 2.2**) in the Academy. With the sparse facilities available in the F&RS Academy, Audit observed that the 3173 trainees who enrolled in Academy during the audit period (2014-19) could not get the benefit of quality training in simulated environment to equip them both mentally and physically for quick response during a crisis situation.

²⁷ The amount was from fund provided by 13th FC during the period 2010-11 to 2014-15 of which ₹103.97 lakh remained unutilised with KSDMA. The remaining amount of ₹5.72 lakh in the fund balance of KSDMA was approved by GoK (March 2017) to be utilised for making the SEOC Green Energy Compliant.

GoK replied (November 2020) that KSDMA had to book the amount as outgo of funds since the amount allotted and released by Government under the supplementary grant was in turn released to F&RSD and the same has subsequently been resumed by Government. The efforts made by the department to procure items in 2018-19 fell through because the Government did not release the resumed funds mainly due to the adverse ways and means position arising from the floods of 2018. GoK also referred to the audit contention that had the purchases been effected the material could have been utilised for training purposes as hypothetical. The reply is not justifiable as KSDMA should have monitored more closely the utilisation of funds released by it. GoK informed in the Exit conference (January 2021) that the proposal to re-credit the funds to F&RSD and revalidate it for the purposes for which allotted or return the funds to KSDMA for capacity building has been rejected (July 2020) by the State Executive Committee.

Audit notes that the shortage of equipment at the Academy was also accompanied by shortages in Fire and Rescue stations and hence needs immediate attention as Fire and Rescue Services Department, established in 1962 is the dedicated force under Government of Kerala equipped for rescue services during disasters. In exercise of the powers vested in the Disaster Management Act 2005, KSDMA proposes the annual fund requirements to Government of Kerala for Disaster Management. Analysis of records relating to formulation of Annual plans of KSDMA from 2016-17 onwards showed that though regular provision of funds to F&RSD was made in the annual plan proposals of KSDMA and ₹25 crore allotted earlier²⁸ for the purchase of modern rescue equipment, the equipment in the test-checked fire stations was not adequate to meet the unprecedented flood situation in 2018. The fire station at Chengannur, for instance, one of the worst hit areas during 2018 flood did not possess Rubber Dinghy boats, speed fibre boats or scuba sets. Rubber dinghy boats from Tamil Nadu and Odisha had to be depended upon. No high beam lights were available for night rescue operations. Communication devices such as HAM radios were not seen utilised effectively in test-checked districts.

Audit observed that urgent attention needs to be given to reviewing availability of equipment in possession of the Academy and fire stations across the State.

Recommendation 2.6: Priority needs to be given to review the adequacy of equipment, vehicles and infrastructural facilities in the Fire and Rescue Services Academy as well as in Fire and Rescue stations so that the GoK's dedicated force for rescue services may be adequately equipped to handle any flood or other disaster situation.

²⁸ between 2009-10 and 2012-13

2.7. Non-functioning of Virtual Cadre for Disaster Management

The Kerala State Disaster Management Plan (KSDMP) approved (September 2016) by Government of Kerala with its focus on disaster risk reduction in the State, envisaged formation of a Virtual Cadre for Disaster Management. The Virtual Cadre would principally be 15 selected individuals (one from each district and one at the State level) from each department, with at least 20 years or more of service left. The members of this Virtual Cadre would be the departmental nodal officers responsible for liaising and coordinating with KSDMA and DDMA in disaster management. It was envisaged that the disaster-specific nodal departments through Virtual Cadre would also work in tandem with the State Emergency Operations Centre (SEOC) and District Emergency Operations Centres (DEOC) for ensuring coordinated response to disastrous events.

Departments were to intimate to KSDMA, the names of members nominated to the Virtual Cadre. State Government was to issue an Executive order under Section 16²⁹ of the DM Act, 2005 formalising³⁰ the Virtual Cadre once the selection list was approved by the State Executive Committee (SEC). Audit observed the following;

- Consequent upon the formulation of KSDMP in September 2016, GoK issued (November 2017 and February 2018³¹) orders instructing Heads of 26 Departments to furnish details of officials to be included in the Virtual cadre to KSDMA before 31 December 2017. Eight³² Departments forwarded (between November 2017 and May 2018) the lists of officials to be included in the Virtual Cadre of disaster management. The information furnished by five³³ out of the eight Departments was not in consonance with the criteria stipulated in the Government order with reference to educational qualification, date of entry in service and years of service left. Though the data were returned to the departments seeking rectification, no further response was obtained from the departments.
- KSDMA did not take up with SEC, the matter of approval of the selection lists of the three remaining departments. Consequently, GoK did not issue executive orders under Section 16 of Disaster Management Act, 2005 for formalising the Virtual Cadre.

²⁹ The State Government shall provide the State Authority with such officers, consultants and employees, as it considers necessary, for carrying out the functions of the State Authority

³⁰ Paragraph 5.3 of State Disaster Management Plan

³¹ Order was issued for including one more Department.

³² i) Commissionerate of Land Revenue, ii) Public Works Buildings, iii) Directorate of Panchayat, iv) Directorate of Health Services, v) Directorate of Mining and Geology, vi) Directorate of Ground Water Department, vii) Directorate of Soil Survey and Soil Conservation and viii) CE Irrigation and Administration

³³ i) Directorate of Panchayat, ii) Directorate of Health Services, iii) Directorate of Mining and Geology, iv) Directorate of Soil Survey and Soil Conservation and v) CE Irrigation and Administration

Government cited (November 2020) insufficient allotment of funds and difficulty in enrolment to a voluntary and non-remunerative service as hurdles in implementation of the scheme and stated that 96 officers from eight departments have been initially provided training and inducted and that more personnel are expected to be inducted subject to availability of funds and willingness of officers.

To the specific question of why lists of officials of the three Departments mentioned above were not presented to SEC and Executive orders issued formalising the cadre, Member Secretary KSDMA replied in the Exit Conference (January 2021) that a prudent examination was required before finalising the cadre.

Audit is of the view that considering the envisaged role of the Virtual Cadre in disaster risk reduction through effective liaising and coordination with KSDMA/ DDMA and SEOC/ DEOCs, it is imperative that the State gives attention to operationalise effectively the Virtual Cadre across all the departments at the earliest. Since the State Government was to issue an Executive order under Section 16 of the DM Act, 2005 formalising the Virtual Cadre once the selection list was approved by the State Executive Committee, non-approval of a selection list would in effect be reflective of the relative low priority being given to implementation of this item in the State's Disaster Management Plan. Since the Kerala State Disaster Management Authority currently functions with only 27³⁴ full time employees, the role that could be potentially played by an active Virtual Cadre during disasters cannot be underestimated.

Recommendation 2.7: Virtual Cadre needs to be formalised and strengthened in the State so that the disaster-specific nodal departments could work in tandem with the State/ District Emergency Operations Centres through the cadre, for ensuring coordinated response to disastrous events.

³⁴ Position as in March 2019