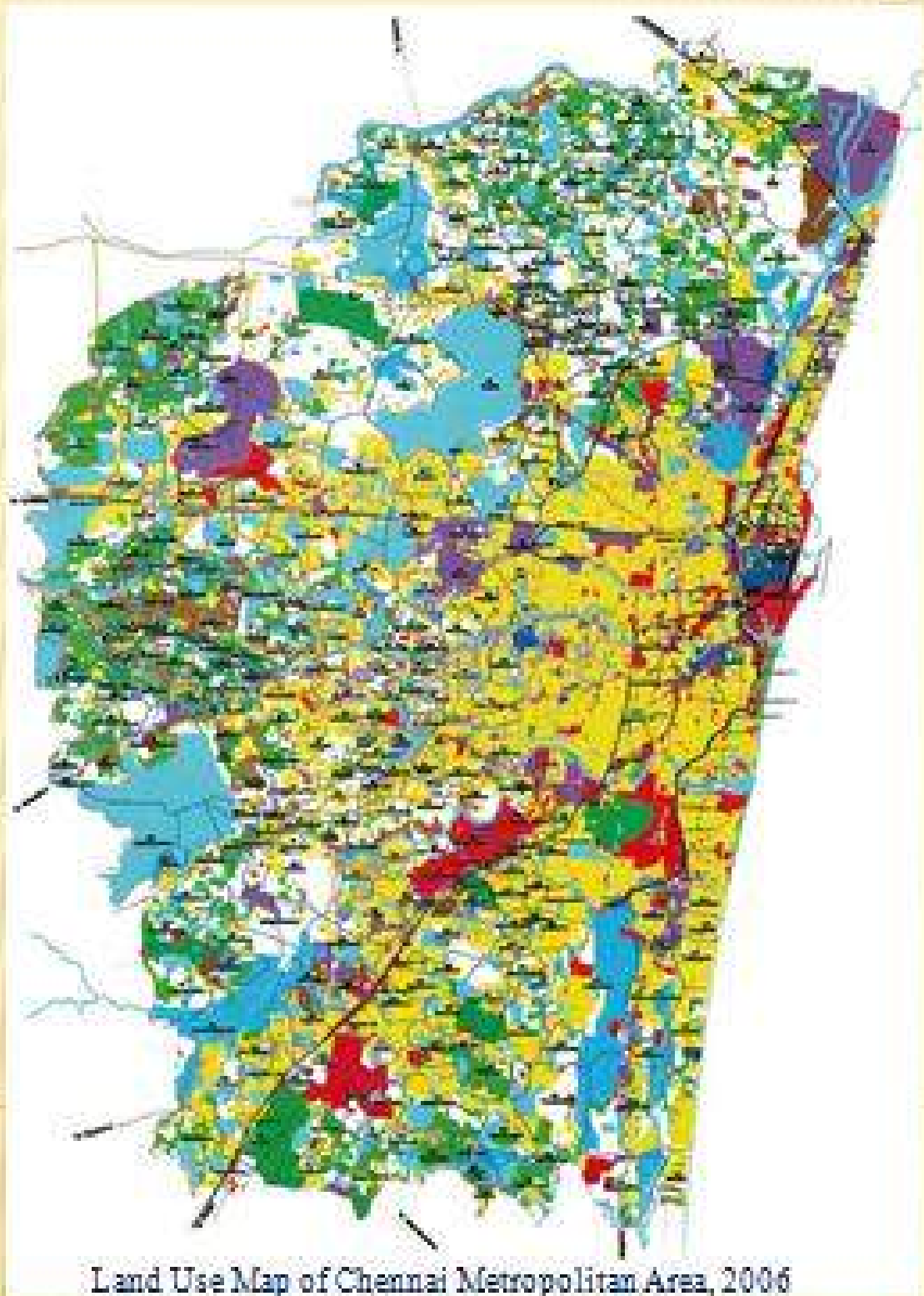


# **CHAPTER II**

## **PLANNING**





## CHAPTER II

### PLANNING

Holistic planning holds the key to manage flooding and simultaneously addresses the need to harness water resources in the context of increasing urbanisation and depleting ground water tables.

Section 9-C of the TN Town and Country Planning Act, 1971 provides for preparation of a Master Plan for the Chennai Metropolitan Area (CMA) by Chennai Metropolitan Development Authority (CMDA). Master Plans prescribe policies and strategies for the overall development of CMA, taking a long term view of requirements like efficient functioning of traffic and transportation sector, plan for reclassification of land and development of basic amenities. As part of the strategy, land use and construction of buildings were required to be regulated by CMDA under Master Plans for orderly development of the city.

#### 2.1 Planning for regulation of land use

The First Master Plan (FMP) for CMA came into effect in 1976 for a period covering 20 years till 1995. FMP dealt with land use planning through earmarking of land for residential, commercial, institutional, agricultural and recreational use. Under the Development Control Rules (DCR), 1976, framed under FMP, CMDA was responsible to regulate land use in CMA in terms of the FMP.

Further, FMP proposed to develop three satellite towns and six urban nodes to absorb future urban population and to construct ring roads, express ways, Mass Rapid Transit System (MRTS), etc. The proposals for satellite towns and urban nodes to decongest the city were not achieved as planned. Moreover, the CMDA failed to maintain the land use conversions, as the agricultural land and open space decreased more than what was projected. The agricultural land, which was projected to decrease by 36,510 hectare, had decreased by 61,120 hectare and the open space which was projected to increase by 2,556 hectare had actually decreased by 5,176 hectare. The area under agriculture and open space got reduced due to their conversion for various other purposes like, residential, commercial, institutional and industrial use. Thus, the violation of FMP resulted in haphazard growth of the city, leading to adverse consequences such as congestion, impact on environment and flooding in the city.

After FMP, the Second Master Plan (SMP) ought to have come into place with effect from 1996. But, the SMP, originally prepared by CMDA in 1995, was finally approved by GoTN only in 2008 as it was not properly prepared by CMDA after taking into account the urban development, having taken place by doing necessary survey. SMP, which came into effect with effect from 2008, was to guide the development of CMA till 2026. Under the

Development Regulations (DR), 2008, framed under SMP, CMDA was responsible to regulate land use in CMA in terms of the broad parameters of the SMP.

We observed that GoTN did not accord adequate importance to urban planning as evidenced by the delay of five years to approve the FMP after the TN Town and Country Planning Act, 1971 came into force, and an abnormal delay of 13 years in notifying (2008) the SMP after the end of plan period of FMP (1995).

The strategies of SMP were, *inter alia*, (i) to address the present constraints in disposal of flood water as an opportunity to manage and use the excess water for augmenting urban water supply through creation of additional storage capacity, (ii) developing a network of open spaces to provide green environment to be used as flood moderators during critical months of the year, (iii) to maintain existing water bodies by preventing encroachments, and (iv) improvement of macro drainage systems and integration of micro drainage with the macro system. The observations relating to non-adherence to the strategies of SMP are discussed in this Report.

### 2.1.1 Unauthorised land use conversion

(a) The TN Town and Country Planning Act, 1971 envisages approval of Master Plan, which includes the land use plan, by GoTN. Further, the Act envisages review of the approved Master Plan every five years for effecting necessary changes in the plan if considered appropriate based upon survey.

With a view to cater to the growing population, the Master Plans projected additional requirement of land for housing, industrial and institutional purposes and for other infrastructural facilities by converting agricultural land. The land use in CMA (a) as projected in FMP and SMP, (b) the actual area available in 1973 and 2006 as per survey done by CMDA and (c) the position in 2016 as arrived at based on approved land use changes, are shown in **Table 2.1** below:

**Table 2.1: Land use changes in CMA**

Land use	(Land in hectare)				
	Area available as of 1973 (Before FMP)	Area projected in FMP for 1995	Area available in 2006 (After FMP and before SMP)	Area projected in SMP for 2026	Area available in 2016 (during SMP)
(Figures in bracket represent percentage to total land area)					
Agriculture	73,689 (60)	37,179 (31)	12,569 (10)	7,296 (6)	12,322 (10)
Open space	5,742 (5)	8,298 (7)	566 (0.5)	1,393 (1)	553 (0.5)
Residential	16,932 (14)	41,667 (35)	32,400 (27)	52,937 (43)	32,628 (27)
Others	26,611 (21)	31,772 (27)	76,602 (62.5)	60,511 (50)	76,634 (62.5)
<b>Total</b>	<b>1,22,974</b>	<b>1,18,916</b>	<b>1,22,137</b>	<b>1,22,137</b>	<b>1,22,137</b>

(Source: Details furnished by CMDA)

As could be seen from the above, during the period between 1973 and 2006, the area under agriculture came down from 73,689 to 12,569 hectare, i.e., from 60 *per cent* to 10 *per cent* of the total area. During the same period, open space came down from 5,742 to 566 hectare, i.e., from 5 *per cent* to 0.5 *per cent* of the total area. We observed that the area under agriculture and open space, which are flood moderators, came down by beyond what was projected in master plans.

We noticed that during the interim period between FMP and SMP, without any plan being in force, CMDA allowed 439 land use conversions from agriculture zone (1,229 hectare), Open Space and Recreation (O&R) zone (345 hectare) and sensitive areas such as water bodies (14 hectare). We observed that, in the absence of a Government approved Master Plan during 1996 to 2008, approval of the above land use conversions was in violation of the Town and Country Planning Act, 1971.

Instances of irregular approvals for land use conversion after approval of SMP have been discussed in detail in succeeding paragraphs (**Paragraphs 2.3 and 2.4**). Further, despite rapid demographic changes taking place in CMA, CMDA did not review SMP after five years as envisaged in the TN Town and Country Planning Act. Moreover, GoTN also did not direct CMDA to carry out such a review.

Thus, land use changes were carried out not only in excess of the projection made in Master Plan, but also in violation of the Town and Country Planning Act, 1971 and without the envisaged review of Master Plan. The indiscriminate development of land increased soil runoff and consequent depletion of ground water table, contributing to flooding.

Highlighting the importance of planning, the Parliamentary Standing Committee on Home Affairs, which presented (August 2016) its Report on Chennai flood to the Parliament, had also concluded, *inter alia*, that unplanned urbanisation was a contributing factor for floods in and around Chennai.

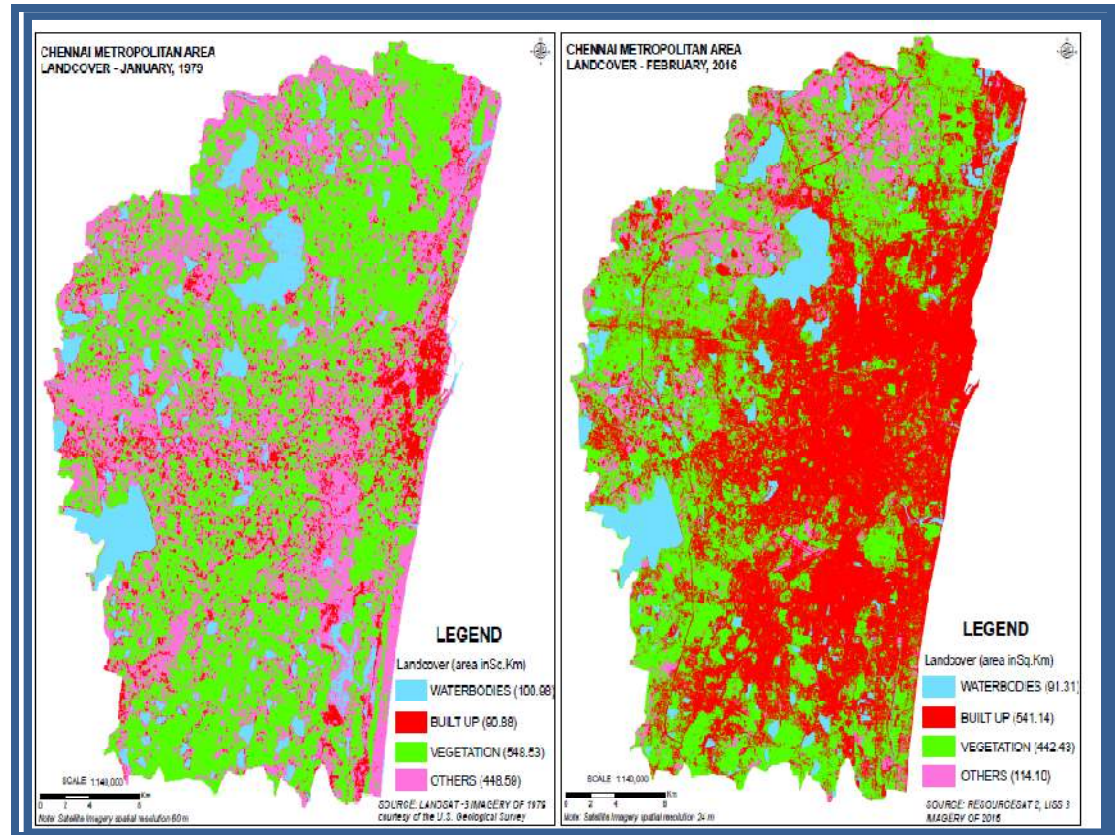
***Recommendation No. 1: We recommend that GoTN should initiate timely action for review of SMP as contemplated and to decide a time frame to start action on the next Master Plan to avoid gap between Master Plan periods.***

(b) Changes in land use, either authorised by CMDA or taking place through illegal constructions as discussed in **Paragraph 2.1.2** below, contributed to changes in the overall land cover of CMA.

In order to analyse the change in land cover over a period of time, we sourced satellite imageries of CMA as of January 1979 and February 2016 through National Remote Sensing Agency, Hyderabad, a body under the Indian Space Research Organisation (ISRO), and got the imageries digitally analysed (April 2017) by the Institute of Remote Sensing, Anna University, Chennai. The analysis disclosed that the built-up area in CMA increased from 90.88 sq.km in 1979 to 541.14 sq.km in 2016. Correspondingly, the area under water bodies and vegetation came down from 100.98 to 91.31 sq.km

and 548.53 to 442.43 sq.km respectively as shown in the **Map 2.1** (detailed map at **Appendix 2.1**).

**Map 2.1- Digitally analysed satellite images of CMA**



(Source: Analysis by Institute of Remote Sensing, Anna University, Chennai)

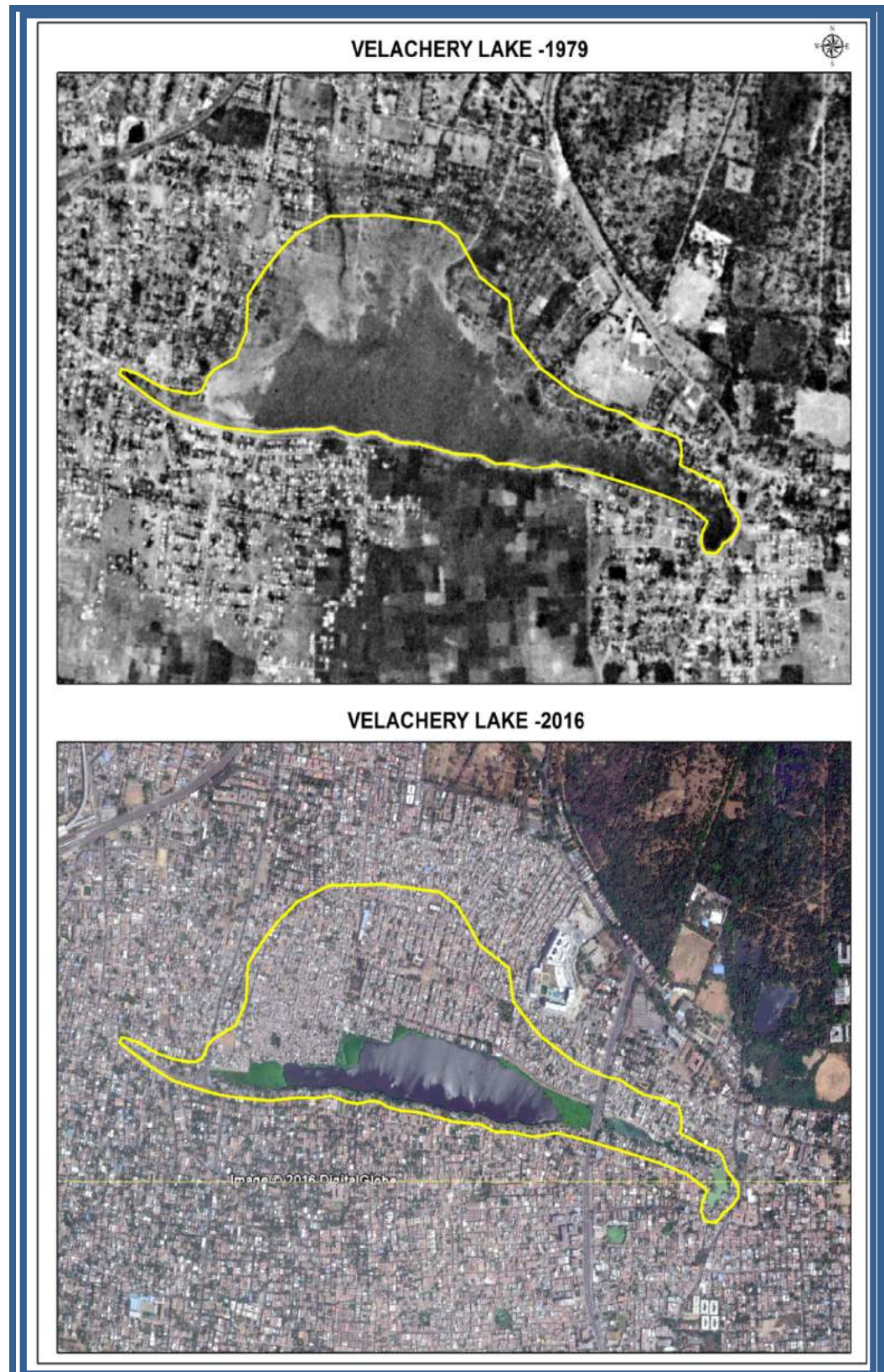
While the FMP and SMP, together projected a total increase in built-up area by 330.58 sq.km (33,058 hectare) over the 50 years period between 1976 and 2026, the actual increase in built-up area, as worked out using satellite imageries, over 37 years period between 1979 and 2016 was 450.26 sq.km. Thus, the satellite data, which depicts the actual ground reality, indicated that much higher building activity had taken place than what had been approved by CMDA, pointing to large scale illegal constructions as has been pointed out in **Paragraph 2.1.2** below. Simultaneously, the area under water bodies declined 9.67 sq.km between 1979 and 2016.

The disappearance/shrinkage of some of the urban lakes between 1979 and 2016, as noticed from the satellite maps are depicted in **Exhibits 2.1 to 2.5**.



**Exhibit 2.1: Velachery Lake**

Velachery Lake, located in the thickly populated southern part of the city, shrank over the years, leading to reduction in storage capacity of the lake.



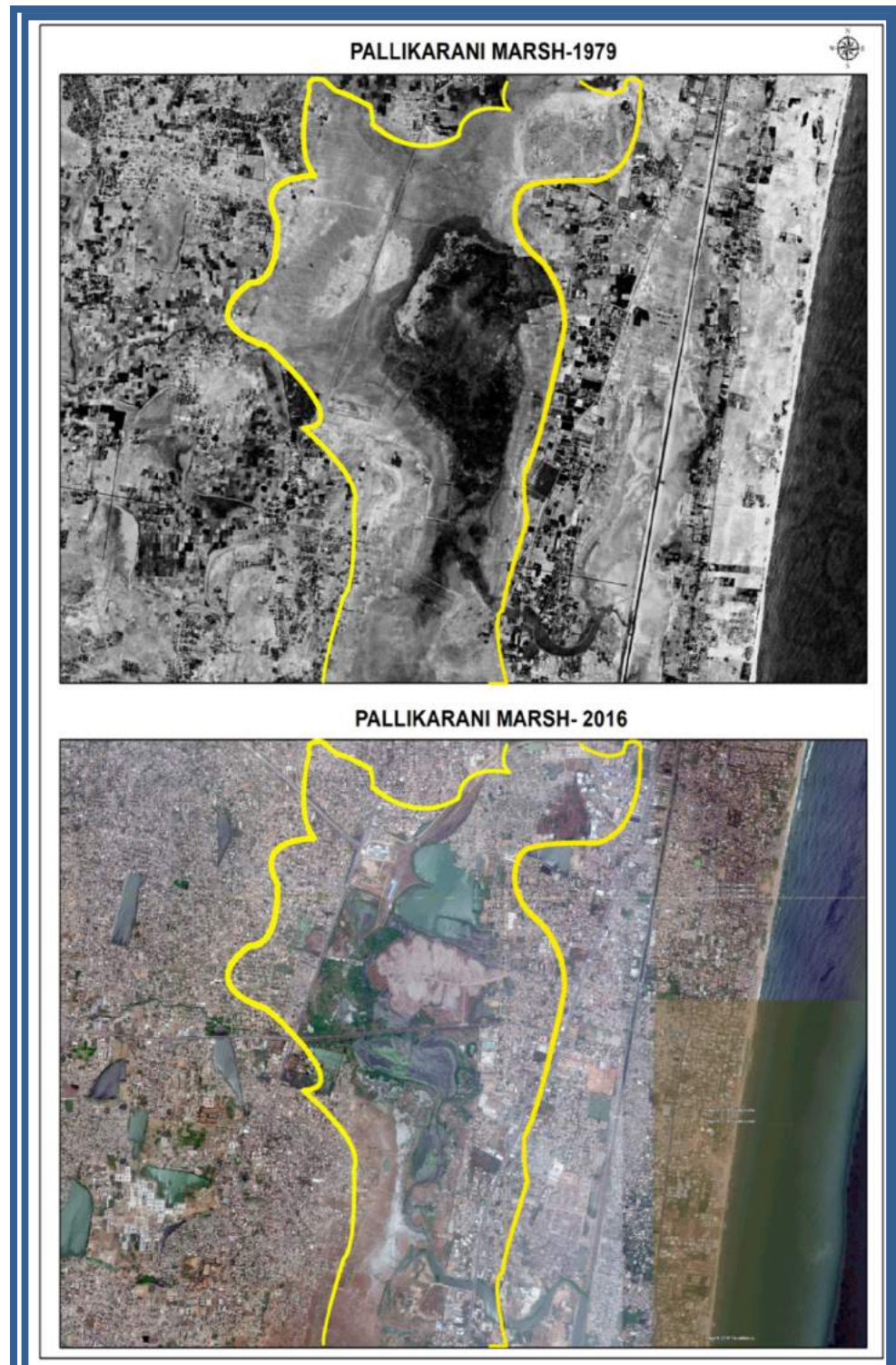
Map not to scale

(Source: National Remote Sensing Agency, Hyderabad and Google Digital Globe)



**Exhibit 2.2: Pallikaranai Marsh**

The Pallikarani Marsh, a unique fresh water swamp in CMA, which was measuring 5,000 hectare in 1975 shrank to 695 hectare in 2016 mainly due to the decision of GoTN to allow construction on a stretch of 500 metres on either side of Rajiv Gandhi Salai (IT corridor) to facilitate development of IT industry.



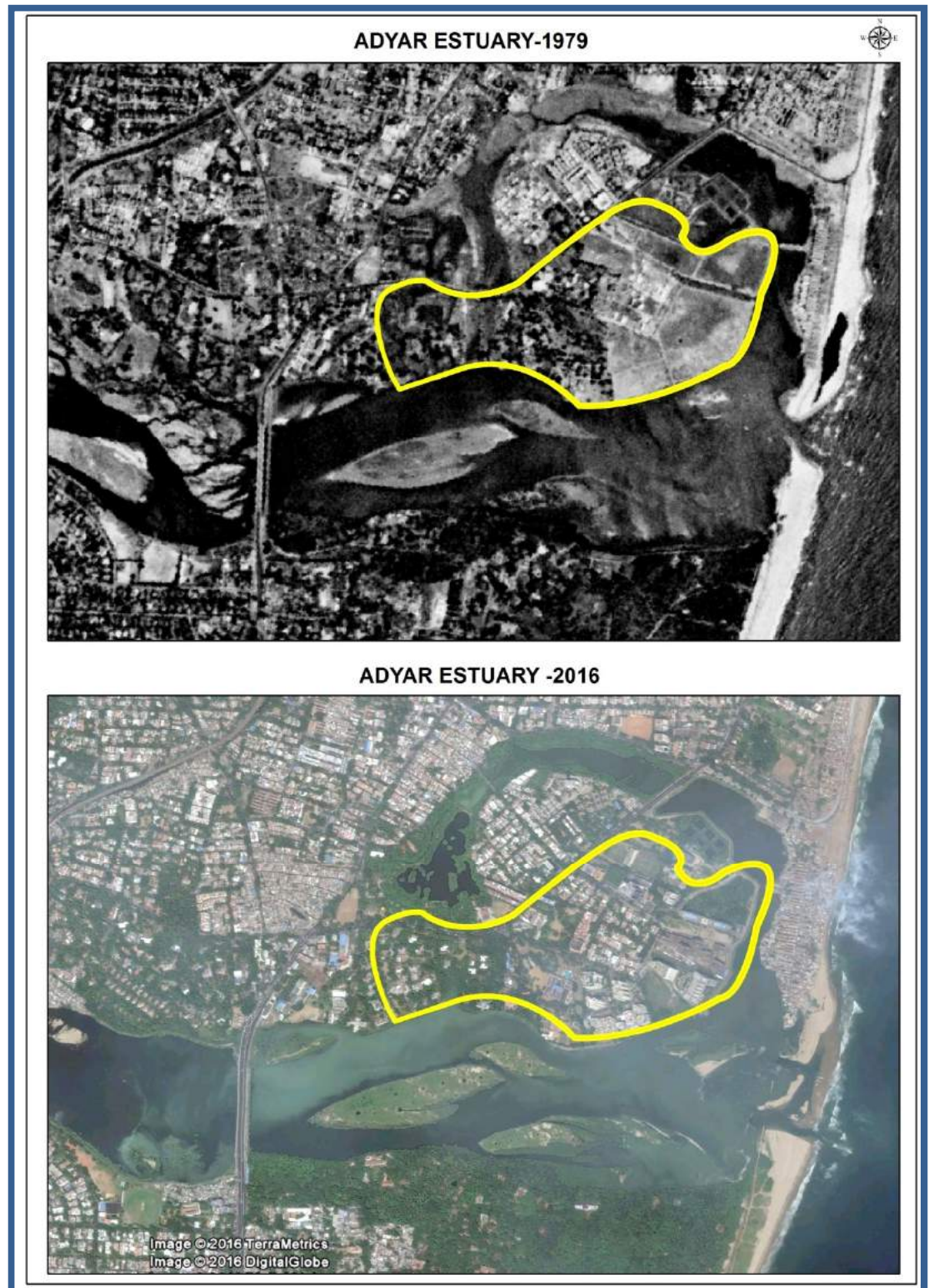
Map not to scale

(Source : National Remote Sensing Agency, Hyderabad and Google Digital Globe)



**Exhibit 2.3 : Adyar Estuary**

Adyar Estuary, a unique eco-system at the mouth of Adyar River, is surrounded by thickly populated areas of Adyar, Raja Annamalaipuram and Mandaveli. Large scale constructions in the Estuary shrank the area over the years as depicted below.



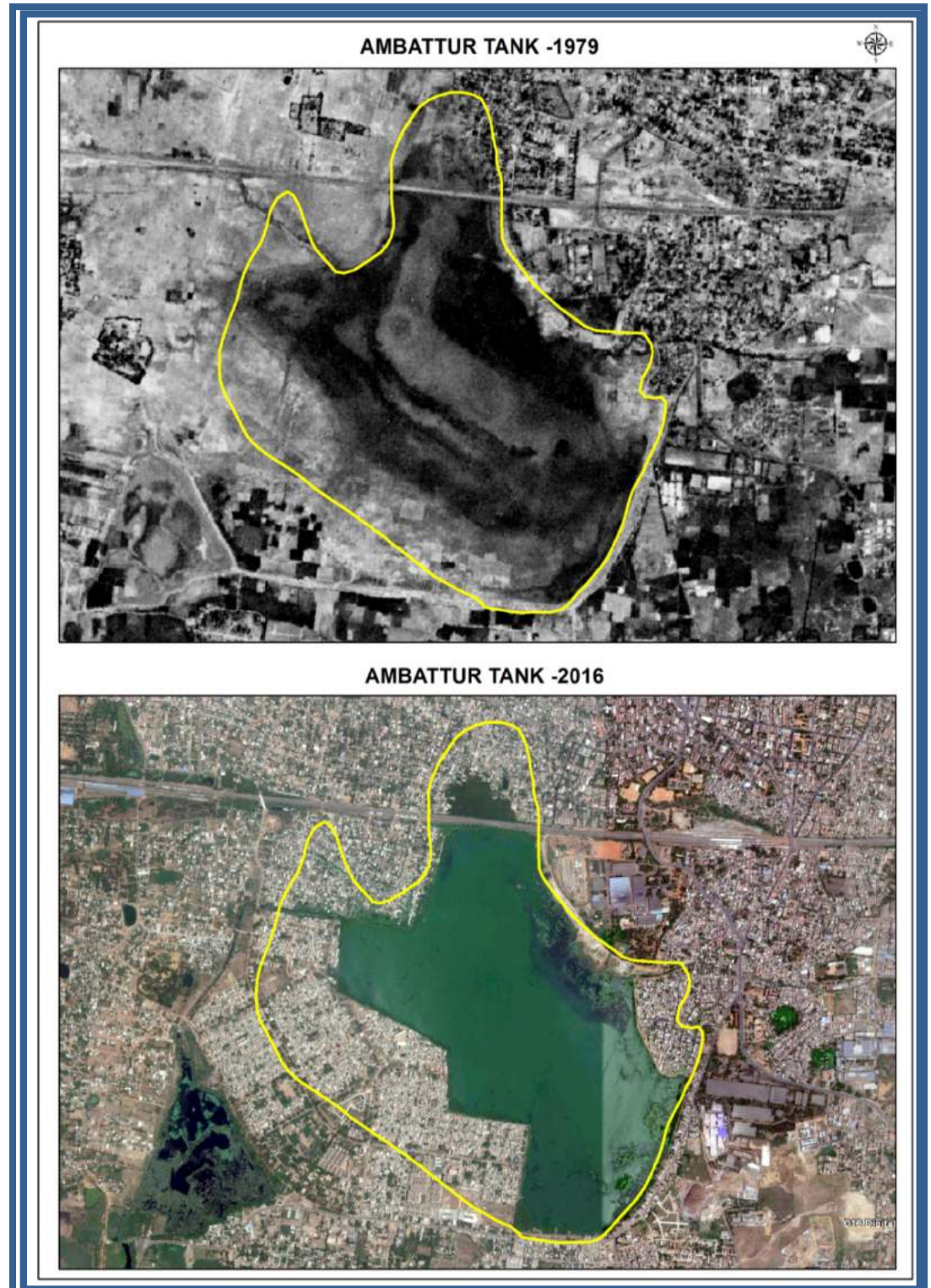
Map not to scale

(Source : National Remote Sensing Agency, Hyderabad and Google Digital Globe)

**Exhibit 2.4: Ambattur Tank**



Ambattur, located at the north western side of the city, is a thickly populated residential area with scattered small industries. The Ambattur Tank, adjoining Ambattur, which influences flow in Kosasthalaiyar River shrank in size over the years due to constructions inside the tank bed. The overflowing Ambattur Tank caused inundation in the adjoining areas.



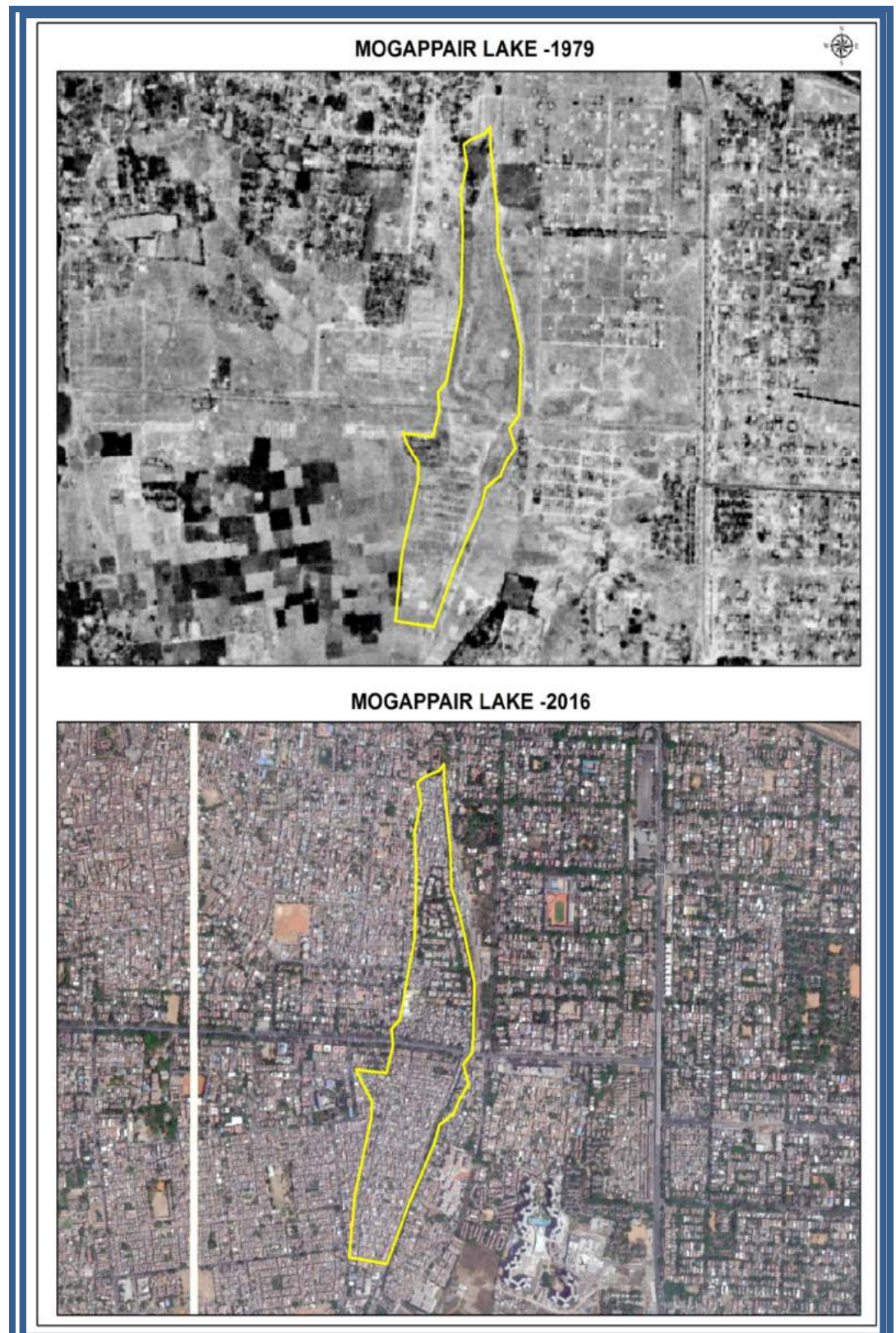
Map not to scale

(Source : National Remote Sensing Agency, Hyderabad and Google Digital Globe)

**Exhibit 2.5 : Mogappair Lake**



Constructions on the lake bed consumed the entire Mogappair Lake located in the north western part of the city.



Map not to scale

(Source : National Remote Sensing Agency, Hyderabad and Google Digital Globe)

We observed that drastic increase in the built-up area including those unauthorisedly allowed, which contributed to decrease in the area of water bodies and increase in soil runoff of rain water, exposed the city to the risk of flooding.

### 2.1.2 Illegal residential colonies

Development Regulations (DR), 2008, framed under Master Plans prohibited development of sites without CMDA's approval. The Honourable Madras High Court, Chennai, hearing a petition on illegal colonies, directed (March 2016) the GoTN to furnish information on illegal colonies which had come up after 1989<sup>1</sup>. CMDA, however, did not have any mechanism to monitor illegal colonies cropping up within its jurisdictional area. Therefore, CMDA called for this information from local bodies. We noticed that only 19 out of 45 local bodies (including zones of GCC) furnished the required information. The information, as furnished by the local bodies, was furnished to GoTN for placing before the Court. The matter was under judicial scrutiny (March 2017).

As per the data obtained by CMDA, the details of illegal colonies in CMA, as of March 2016, was as under:

**Table 2.2: Illegal colonies in CMA**

Category of local body	Total number of local bodies in CMA	No. of local bodies for which data was available	No. of illegal colonies identified	No. of houses/ house sites involved	Area in hectare
Zones of GCC	15	05	54	NA	NA
Municipalities	08	08	113	7,320	155.87
Town Panchayats	11	05	30	1,259	19.43
Panchayat Unions	10	01	NA	NA	NA
Cantonment bodies	01	NA	NA	NA	NA
<b>Total*</b>	<b>45</b>	<b>19</b>	<b>197</b>	<b>8,579</b>	<b>175.30</b>

\* Total has been worked out with available information. NA- Not Available

(Source: Data furnished by local bodies)

Considering the fact that data was not available in respect of all the local bodies, the number of illegal colonies and the land area of these illegal colonies could be much higher than the above figure of 197 colonies and 175 hectare. During the same period of 1989 to 2016, the actual number of layouts approved by CMDA for residential colonies was 3,084, which meant that illegal colonies were substantial in number.

<sup>1</sup> All unapproved layouts before 1989 were regularised by GoTN



We found that GoTN was aware of the issue of illegal colonies and amended (2009) the Registration Act, 1908, to prohibit registration of unapproved layouts. The amendment was to come into force on such date as the GoTN may issue by notification. As GoTN delayed notification of the Act, registration of unapproved layouts continued unabatedly. In 2015, based on a writ petition filed by an individual, the Honourable Madras High Court, noted that large scale unapproved layouts contributed to the floods of 2015 and imposed a ban (September 2016) on registration of plots/buildings in unauthorised layouts. GoTN also issued (October 2016) an order notifying the 2009 amendment to Registration Act 1908. We observed that the GoTN, by delaying enforcement of the amendment to the Act, contributed to the growth of illegal colonies.

Thus, the abnormal delay of GoTN in notifying the amendment to the Registration Act, 1908 and lack of control on the part of CMDA and failure of local bodies in controlling unauthorised developments had rendered the mechanism for urban planning ineffective, as even with the limited data, 197 illegal layouts had come up in CMA after 1988.

***Recommendation No. 2: We recommend strict enforcement of the amended Registration Act to curb mushrooming of illegal colonies. CMDA should strengthen its monitoring activities and play a proactive role in identifying and stopping illegal constructions.***

## **2.2 Policies and plans focusing on flood prevention and moderation**

### **2.2.1 Non-revision of State Water Policy**

Tamil Nadu State Water Policy (SWP), 1994 was formulated based on the National Water Policy (NWP), 1987. NWP was updated in 2002 and 2012. NWP 2012 envisaged planning and management of water resources by incorporating coping strategies for possible climate changes. As per NWP 2012, the acceptability criteria for new water resources projects were to be re-worked in view of the climate changes. However, SWP was not revised in line with NWP. A comment was also included in the C&AG's Audit Report (Economic Sector), GoTN for the year ended 31 March 2013, regarding non-revision of SWP. GoTN constituted (August 2013) a Committee for revising the SWP and the Committee presented its draft policy in August 2014. The draft policy, however, was not approved and notified by GoTN even as of November 2016. Non-revision of SWP had impacted various systemic measures like preparation of flood inundation maps, emergency action plan for dams, basin-wise master plans etc., as was required under Central Water Commission (CWC) norms and NWP. We further observed that non-creation of new reservoirs taking into account the climate changes as emphasised in NWP 2012 was one of the reasons for inundation during Floods 2015.

Such lackadaisical approach of Government indicated that no lessons were learnt from the catastrophic floods of 2015 causing huge loss to human lives and properties.

### 2.2.2 Non-preparation of frequency based flood inundation maps

Flood forecasting is an important and cost effective non-structural method to mitigate the impact of floods. The CWC is involved in flood forecasting in a scientific manner. With a view to facilitate CWC in forecasting floods, the National Flood Commission recommended (1982) to assess the areas prone to floods, flooded areas, damages to properties and lives and furnish the same along with connected maps to CWC. The NWP 2012 also envisaged that every State should prepare flood inundation maps based on frequency of floods to evolve coping strategies besides conducting morphological<sup>2</sup> studies for planning and taking measures to prevent permanent loss of land eroded by the river causing damages to their revetments, spurs, embankments, etc. The Water Resources Department (WRD), as the custodian of major waterways, was responsible for preparation of flood inundation maps.

We observed that WRD did not assess the area prone to floods, flooded area, damages to property and lives during the period from 2012-16. As a result, no data as required under National Flood Commission recommendations were furnished to CWC. The connected maps as well as river basin maps were neither prepared by WRD nor furnished to CWC. Further, morphological studies, to evolve flood coping strategies and protecting water bodies were also not conducted as was required under NWP 2012.

GoTN, while admitting non-preparation of flood inundation maps, stated (May 2017) that flood prone areas had been assessed. The reply was not tenable as assessment of flood prone areas would not serve the purpose unless frequency based flood inundation maps are prepared and furnished to CWC for flood forecasting and evolving appropriate coping strategies. As a result, WRD did not have a comprehensive plan for flood prevention measures such as construction of revetments, spurs and embankments and CWC was not facilitated to scientifically issue flood forecasts.

***Recommendations No. 3: We recommend that SWP may be immediately revised by GoTN making it mandatory for WRD to prepare frequency based flood inundation maps.***

### 2.2.3 Non-preparation of Emergency Action Plan for Dams

NWP 2002 stressed the need for preparation of Emergency Action Plan<sup>3</sup> (EAP) for all large dams. Dam Safety Organisation of CWC had also issued (May 2006) guidelines for development and implementation of EAP for dams with due emphasis on procedure to be followed to minimise damage to property and loss of life. The NWP 2012 also reiterated on increased preparedness for sudden and unexpected floods by preparing and updating of EAP.

<sup>2</sup> Study of the configuration and evolution of land forms

<sup>3</sup> Emergency Action Plan is a formal document that identifies potential emergency conditions at a dam and specifies pre-planned actions to be followed to minimise property damage and loss of life

In Tamil Nadu, there are 127 large dams/reservoirs, and in Chennai and suburban areas, there are four large reservoirs (Poondi, Cholavaram, Redhills and Chembarambakkam) which required EAP. However, WRD did not attach due importance to the guidelines of NWP and CWC to prepare EAP for the reservoirs in Chennai and its suburban areas (December 2016). Engineer-in-Chief, WRD stated (March 2017) that action was being initiated to prepare EAP for the dams under World Bank funded Dam Rehabilitation and Improvement Project in a phased manner. He further stated that approval of EAP proposal for two dams (Sothuparai and Servalar dams) was awaited from CWC. Based on the approval of CWC, EAP for other dams would be prepared.

We observed that EAP was a cost effective non-structural measure and it was not appropriate on the part of WRD to link it with the larger and cost intensive Dam Rehabilitation programme. EAP for the reservoirs in CMA could have helped better management of flood discharge from all reservoirs, including Chembarambakkam Tank (**Paragraph 5.8.5**).

***Recommendation No. 4: We recommend early action on preparation of EAP for taking care of safety of dams.***

#### **2.2.4 Non-availability of basin-wise Master Plan**

In 1990, CWC had issued detailed guidelines for preparation of Master Plan for river basins. The guidelines were revised in 2007. The Master Plan was to take into account the catchment area, water potential, storage availability, consumption pattern etc. The SWP, 1994 had also emphasised preparation of a basin-wise master plan for every flood prone basin, as a measure for flood control and water management.

We observed that Master Plan for Chennai and its suburban areas, for its three rivers *viz.*, Adyar, Cooum and Kosasthalaiyar was not prepared (August 2016) to manage the flood situation and for augmentation of water resources.

GoTN stated (March 2017) that the Master Plan would be prepared by engaging a Consultant. We observed that preparation of Master Plan involved coordination between WRD and local bodies as major waterways are under the control of WRD and minor ones are under local bodies. We noticed that no action was taken by WRD to coordinate with local bodies for preparing basin-wise master plan.

Non-preparation of basin-wise Master Plan for CMA, led to unplanned execution of macro and micro drainage networks, as commented in **Paragraphs 5.1, 5.2, 5.3 and 5.4**.

### 2.2.5 Non-enactment of legislation on Flood Plain Zoning

Flood Plains are low-lying land areas adjacent to a river. Flood Plain Zoning (FPZ) is a concept to regulate land use in the flood plains to restrict the damage caused by floods and aims at determining the locations and the extent of areas for developmental activities in such a fashion that it does not impact the environment.

In 1975, CWC circulated a model Bill on FPZ, envisaging provisions for flood zoning authorities, surveys and delineation of flood plain area, notification of limits of flood plains, prohibition or restriction of the use of the flood plains, compensation, and power to remove obstruction after prohibition etc., for enactment. As per National Disaster Management (NDM) guidelines, the areas vulnerable to frequent floods and areas on either side of the existing and proposed drains including rural drains were to be declared as green belts, where no building or other activity, except parks and playgrounds, were to be allowed. The SWP, 1994 mandated that watershed management and flood forecasting for reservoir operations, FPZ and prevention of flood plain encroachment by human settlement and obstruction to flow would be considered along with structural measures, such as embankments and flood channels. The same was reiterated in NWP 2012.

We, however, observed that the suggested legislation on FPZ was yet to be enacted and the SMP, approved by GoTN in 2008, did not provide for FPZ, specifying the distance from the water body i.e. off-set space, upto which development/construction activities were to be restricted. CMDA also did not stipulate any FPZ in its Development Regulations.

To an audit query on enactment of FPZ Act, CE, WRD replied (August 2016) that a proposal (June 2014) to form a Committee to give recommendations for enacting the legislation was under consideration of GoTN (August 2016).

Thus, the lack of legislation for flood plain zoning, resulted in developments abutting waterways, as discussed in **Paragraph 2.3** below.

***Recommendation No. 5: We recommend that the FPZ bill may be enacted at the earliest to prevent constructions along the three rivers of CMA.***

## 2.3 Construction activities along water bodies

Despite clear policies, as discussed in **Paragraph 2.2** above, on preservation of water bodies which are flood accommodators, construction activities along water bodies reduced the area of water bodies and contributed to the floods of 2015. Specific lapses of GoTN and CMDA in this regard are discussed in this paragraph.



### 2.3.1 Granting unauthorised building permission along waterways by CMDA

In the absence of demarcated FPZ and specification of off-set space requirements in the Development Regulations of SMP, Tamil Nadu District Municipalities Building Rules, 1972, regulate the approvals for construction of buildings in urban areas of the State. As per the Rule 7, if a construction site was within 15 m of a water body, water course or well, such measure as may be necessary or as the executive authority may direct, should be carried out to protect the water body.

In June 2012, a committee headed by the Vice-Chairman, CMDA, recommended a buffer zone of at least 15 m between the river and the proposed building, and to issue an office order to that effect.

We noticed that in violation to the extant rules and the recommendation of the Committee, CMDA continued to issue planning permission for buildings within 15 m of water bodies without ensuring any ameliorating measures to prevent damage to the water body. CMDA adopted a procedure of obtaining No Objection Certificate (NOC) from WRD for issuing conditional approvals for constructions adjacent to water bodies. We observed that neither the TN Town and Country Planning Act nor the Development Regulations framed under SMP allowed CMDA to issue conditional approvals subject to adherence to NOC conditions of WRD.

During joint site inspections (August 2016) along with officials of the test checked Municipalities, Town Panchayats and Zones of GCC along Adyar and Cooum Rivers, we observed that special and multi-storeyed buildings listed in **Table 2.3** were approved by CMDA which were falling within 15 m of the waterways. These buildings were inundated and contributed to inundation of neighbourhoods, during the floods of 2015.

**Table 2.3: List of buildings approved on river banks**

Sl. No.	Name of the builders	Year of construction	Name of the water body	Distance from water body
1	Residential building by Pace builders	2012 to 2015	Pappan channel	10 ft
2	Residential building by Shakul Hamid and Bros	2012	Periya Eri	14.06 m
3	Residential building by Mantri Hamlet Private Ltd	2014	Periya Eri	11.72 m
4	Residential building by Jain Housing	2014	Nattukkalvai	Less than three metres
5	Residential building Orchid Springs by Alliance	2012	Korattur Lake	10 m
6	MIOT hospital	NA	Ramapuram Nullah	On the bank
7	Jayanth tech park	NA	Adyar River	On the bank
8	Residential building by Arihant builders	NA	Adyar River	On the bank
9	Residential building by Casa Grande	Ongoing	Adyar River	On the bank

NA: Not available

(Source: Information collected from CMDA and WRD)

Scrutiny of records revealed that in violation to the TN Town and Country Planning Act and the DR framed under SMP, CMDA issued approvals for these buildings on the basis of NOCs. Though CMDA by violating the prescribed rules, issued conditional approvals, the conditions of NOC, so irregularly set, were not even satisfied by the builders/realtors and nor ensured by the CMDA as to whether such conditions were complied with. This is indicative of the fact that CMDA did not bother about the protection of water bodies while issuing the approvals for residential buildings though it was responsible for ensuring implementation of the provisions of the TN Town and Country Planning Act.

The wrong practice of allowing conditional planning permissions on the basis of NOC, had not helped preservation of waterways as adherence to NOC conditions were not enforceable, leading to unplanned developments, contributing to floods.

To an audit enquiry, CMDA stated (October 2016) that in the flood plains of Adyar River and in the areas adjoining the Cooum River, the land had been reserved for agriculture use zone/non-urban use zone to safeguard these areas from flood hazards. The reply was not tenable as CMDA itself had approved special and multi-storeyed buildings, as detailed in **Table 2.3** above and 51 layouts (**Table 2.4**) in selected local bodies along the flood plains of river/channel during the years from 2009 to 2016.

### **2.3.2 Approval of layouts without preservation of water bodies**

Regulation 2 (25) of DR defines layout as division of plots exceeding eight in number and provides for approval of layouts of more than 10 acres by CMDA in CMA.

Regulation 7 (2) of DR prohibited development of sites without CMDA's approval. Approval was not to be accorded without ameliorative measures if CMDA considered the site (i) to be near a water body/course (ii) likely to be inundated with no possibility of proper drainage arrangement, (iii) was a filled up tank or low lying and (iv) was likely to be affected by dampness owing to the sub-soil water. Ameliorative measures that were to be satisfied by CMDA were not defined in the DR.

In the absence of demarcated FPZ, CMDA, without any authority, obtained NOC from WRD which is the custodian of the water bodies, and issued conditional approval for development of sites as layouts which were located within 15 m of the waterways.

NOC issued by the CE, WRD stipulated conditions that were to be fulfilled by the promoter, such as (i) culverts<sup>4</sup> to be constructed across the water way, (ii) provision of storm water drain in the layout, (iii) leaving off-set space from the waterway and (iv) raising the level of the site above maximum flood level of the waterway. CMDA issued layout approvals along with the NOCs issued by WRD, to the local bodies, with instructions to local bodies to ensure

<sup>4</sup> A small structure to allow water to pass under a road

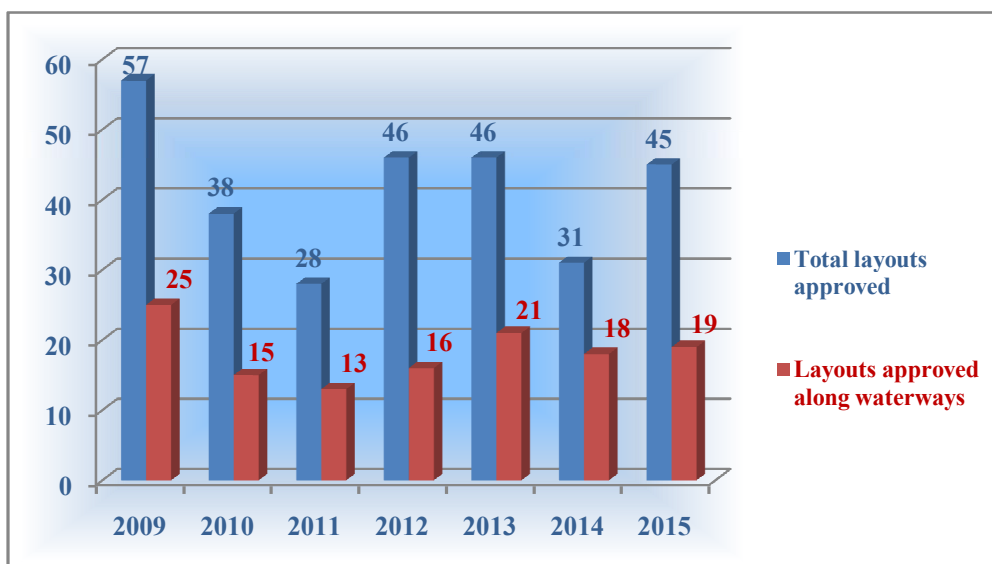
compliance of all conditions stipulated by the WRD by the promoters of the layout and obtain a letter from WRD confirming compliance before release of layout approval.

Once local bodies received application for layout approvals from an individual, which was beyond their delegated powers, they forwarded the application to CMDA for approval. CMDA accorded approval after verifying the conditions like classification of land use, road width, provision of storm water drains and ownership of the site, but had not ensured the distance of 15 m between the water bodies and the sites, which was required under the TN District Municipalities Building Rules, 1972.

We observed that *prima facie*, CMDA issued incorrect approvals to layouts in flood plains along waterways without satisfying ameliorative measures as required under Regulation 7 (2) of DR 2008. In the absence of ameliorative measures that were to be undertaken, CMDA was not competent to give conditional approvals for sites which were located in flood plains. Further, CMDA failed in its responsibility and passed it on to local bodies to ensure that NOC stipulations were complied with. These failures of CMDA are discussed in the succeeding paragraphs.

During 2009-15, CMDA approved 291 layouts in CMA, of which 127 were within 15 m of waterways. The year-wise details of total layout approvals given by CMDA and approvals for layouts which were located in the flood plains of waterways are as shown in **Chart 2.1**.

**Chart 2.1: Year-wise layout approvals - 2009-15**



(Source: Data from CMDA)

Out of the above, we examined the approval process in respect of 51 layouts approved during the period 2009-15, located in three local bodies given in **Table 2.4**.

Table 2.4: Details of layouts approved in CMA in selected local bodies

Sl. No.	Area	No. of layouts approved	No. of layouts within 15 metres of waterways	Area in acres along water course converted as layouts	Original land before conversion into layout
1	Kundrathur	63	23	125.07	Ayacut <sup>5</sup>
2	Thiruneermalai	1	1	5.59	Agriculture
3	Poonamallee	50	27	153.00	Not available

(Source: CMDA)

We observed that 23 layouts were approved by CMDA in Kundrathur Panchayat Union and Kundrathur Town Panchayat, one in Thiruneermalai and 27 in Poonamallee Panchayat Union. Joint inspection (October 2016) of 23 sites (**Appendix 2.2**) by Audit along with officials of local bodies, revealed the following factors contributing to flood:

- (i) In one layout, abutting the Kolapakkam Channel in Manappakkam and Kolapakkam Villages, buildings were constructed very close to the channel without any off-set space. Untreated waste water from these buildings was directly let into the channel through outlet PVC pipes, contributing to choking of the channel. CMDA stated that the water course was not affected by the site. The reply of CMDA was found incorrect through field visit.
- (ii) In one layout in Kulathuvancherry and Srinivasapuram Villages, CMDA had even failed to ensure that NOC conditions imposed by WRD in constructing culverts on the roads across a channel passing along the layout were complied with. Further, land filling suggested by WRD, in view of possible inundation, was also not carried out. Though the channel and its branch were duly demarcated in Revenue records, the channel, which runs along the layout, was silted with no traverse. This showed that CMDA was desperate in approving the layouts even when such layouts did not satisfy the NOC conditions to facilitate realtors.
- (iii) In one layout in Varadarajapuram Village, an apartment constructed on the bund of the Adyar Odai<sup>6</sup>, narrowing its width and in another layout the natural drain (vaikal), was encroached by a temple and houses. On this being pointed out by Audit, CMDA stated that the Commissioner of Kundrathur Panchayat Union was requested to ensure the compliance of NOC conditions of WRD. The reply, being futuristic in nature, had not addressed the deficiency pointed out. It appears from the reply that CMDA is still resorting to the inappropriate NOC conditions of WRD and is in a mode of complete denial from their act of violation of the extant rules. CMDA, without taking any measures to evict the encroachers and demolish the buildings occupying the water body, approved the layout, causing further damage to the water body.

<sup>5</sup> Agricultural area irrigated by a tank

<sup>6</sup> Rivulet



(iv) In three out of six layouts in Kundrathur Village, there were unapproved buildings and encroachment on the channel. The channel was not continuous and no demarcations were available. It was filled with debris. The road culvert provided across the channel was only for a length of three meters as against 10 m stipulated by WRD (**Exhibit 2.6**). In three other layouts, the channel was occupied by unapproved buildings.

**Exhibit: 2.6: Smaller than stipulated culvert at Kundrathur Village**



(Source: Photo taken by Audit team during Joint Inspection)

(v) In three layouts in Mannancherry Village, culverts as stipulated by WRD across a field channel were not constructed. The channel was occupied by buildings. No action was taken by the Executive Officer of Kundrathur Town Panchayat to ensure provision of culvert as stipulated in the NOC. In another case of two layouts in Naduveerapattu, the WRD conditions to earmark channel boundary were not fulfilled.

CMDA replied that removal of encroachments and removal of debris was the responsibility of local body. The reply did not address the issue that approvals were given without ensuring ameliorating measures. It further indicated the fact that despite knowledge about encroachments, CMDA did not pay due attention to preservation of the water body, leading to inundation and still CMDA was passing the blame on local bodies.

CMDA further stated (November 2016) that the proposals for layouts were approved with the permission of the WRD. The reply revealed that the CMDA was incorrectly putting the onus of preserving the water bodies on WRD. The NOC issued by WRD had prescribed the condition that the promoter should maintain the channel to its width, protect the channel from encroachment and also desilt the channel in some cases. It was seen that the promoter had no role, once he had sold all the plots in the layout. Thus, CMDA in connivance with WRD, promoters and local bodies allowed

development/construction activities along flood plains without ensuring the fulfillment of the conditions of NOCs.

***Recommendation No. 6: We recommend that CMDA should stop issuing conditional approvals for layouts and buildings along water bodies. Approval should be issued only after ensuring that ameliorating measures were completed.***

## 2.4 Non-adherence to land use planning

Section 9-C of the TN Town and Country Planning Act, 1971, empowered CMDA to prepare an existing land use map and such other maps as may be necessary for preparing any development plan. Zoning provides spatial segregation of conflicting uses besides preservation of open space, prime agriculture land and ecologically sensitive areas. The DCR and DR framed under FMP, 1976 and SMP, 2008 respectively for CMA contained detailed regulations on land use zoning and reservation of open space for recreation and public use.

Land use is divided into various zones and all developments in an area are to be regulated with reference to the Land Use classification<sup>7</sup> indicated in the SMP and the DRs specify the permissible usage in each zone.

Section 32 of the TN Town and Country Planning Act empowers GoTN to approve variations of land use. CMDA, however, was not authorised to reclassify water bodies, O&R zone, Non-urban zone and Redhills catchment areas for other purposes as per FMP and SMP.

In order to curtail indiscriminate conversion of agricultural wet lands, the TN Town and Country Planning Act, 1971 was amended in March 2012 which stated that “while preparing the Master Plans, most of the agriculture wet lands are earmarked under agricultural use zone and any conversion to other uses will be entertained only after obtaining a Government order after following due procedures with full justification as per the Act provisions”.

Results of the scrutiny of zone conversions approved by CMDA are discussed in the sub-paragraphs below:

### 2.4.1 Non-preservation of agricultural land

In the XII Five Year Plan (2012-17), one of the thrust areas was to develop a mechanism to control diversion of fertile agricultural land and wet land for non-agricultural purposes and protection of wet land and water bodies was one of the strategies while preparing the Master Plans. We noticed that historically, the area of agriculture land in CMA kept shrinking. The area which stood at 73,689 hectare in 1973, had shrunk by 83 *per cent* in 2006 to 12,569 hectare.

<sup>7</sup> Land uses are categorised as Primary Residential, Mixed Residential, Commercial, Industrial, Institutional, Agricultural, Urbanisable, Open Space and Recreation, Non-urban and Water bodies

During preparation of SMP, the Director of Agriculture had recommended (August 2007) the implementation of SMP without affecting the area of agricultural land. A Group of Ministers had also decided (July 2008) that the land use allocation should not push down the agricultural activity and substantial allocation of land for agricultural activities should be ensured. Contrary to these recommendations, SMP, 2008 projected that there would be no agricultural land in Chennai City by 2026 and only 7,296 hectare would remain as agriculture land in CMA. This further indicated a projected reduction of 42 *per cent* in the agriculture area from what was existing in 2006.

On analysing the issue concerning conversion of agricultural land for other uses, we noticed that in 1991, GoTN had imposed a ban on conversion of agricultural wet lands except with the concurrence of the Government in Agriculture Department. Subsequently, in 1992, Government, while reversing their own order, exempted agricultural wet lands which were already approved for conversion in Master Plans prepared by planning authority, from obtaining concurrence of Government. As such, CMDA got the freedom to convert agricultural wet lands which were already approved in the Master Plan for other uses. We observed that between 1996 and 2008, CMDA approved conversion of 1,229 hectare of agricultural land without Government concurrence, even though the FMP period had ended in 1995 and this period was not covered by any Government approved Master plan.

We noticed that, in the SMP, while planning to earmark 5,273 of the available 12,569 hectare of agricultural land for other uses, CMDA had not identified the parcels of land earmarked for conversion. Whenever, a promoter approached CMDA for planning permission on an agricultural land, CMDA accorded approval without seeking the concurrence of Government in Agriculture Department, as conversion of 5,273 hectare had already been approved in the SMP.

We observed that, CMDA violated the Government order of 1991 in approving conversion of 1,740 hectare of agricultural land during the period from 1992 to 2016. Over a 40 years period, between the commencement of FMP in 1976 and 2016, agricultural land in the suburban areas of Chennai in the districts of Kancheepuram (part) and Thiruvallur (part) declined by 47.5 *per cent*, from 1,22,162 hectare to 64,117 hectare.

As conversion of agricultural land for residential or other building purposes affect the water holding capacity of soil, the action of CMDA in approving conversion of agricultural land contributed to the ill effects of floods of 2015.

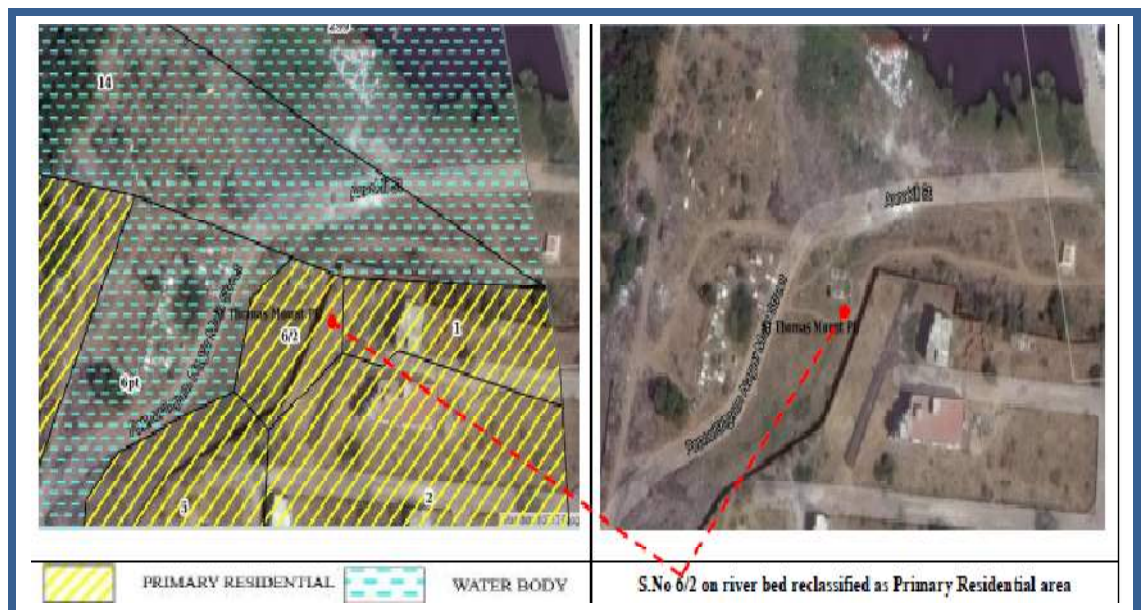
***Recommendation No. 7: We recommend strict implementation of the Government order stipulating Government approval for zone conversion from agricultural land.***

#### 2.4.2 Conversion of water bodies as residential areas

SMP stipulated that water body land should not be converted for any other use. Further, as per GoTN's order (January 1987), "It is important to protect and maintain water streams, wells and tanks. The encroachment in water bodies are to be evicted and monitoring arrangement has to be made to avoid future encroachments. As such, Government imposed ban on regularisation of any encroachment in water bodies".

Despite the above stipulation, CMDA approved during 2009-16 conversion of 9.32 hectare of water bodies as residential zone at seven locations. Audit scrutiny of five cases involving five acres, revealed that in three cases (0.60 hectare), survey numbers<sup>8</sup>, which related to water bodies/river courses were subdivided by the Revenue authorities and *Pattas* granted to private individuals. CMDA approved reclassification of these water bodies land as Primary Residential<sup>9</sup> and Mixed Residential<sup>10</sup> zones on the strength of the ownership established through *Patta* issued by Revenue authorities though these lands were lying well within Adyar River. GIS maps of water bodies super-imposing survey numbers showing developments inside water bodies are shown in **Exhibits 2.7 to 2.11** below:

**Exhibit 2.7: Reclassification of water body in St.Thomas Mount - Pozhichalur Village**



Map not to scale

(Source: Google Hybrid Land use Information System available in CMDA website)

<sup>8</sup> Survey Nos. 170/2 and 170/3C of Nandambakkam Village in Nandambakkam Town Panchayats 6/2 of Pozhichalur Village and Survey No. 1/3B3 of Manapakkam Village in Kundrathur Panchayat Union

<sup>9</sup> Zone earmarked for residential buildings, professional consulting offices, petty shops, schools, parks and play fields

<sup>10</sup> Zone earmarked for all uses permitted in PR and hotels, community halls, recreation clubs, dispensaries, Government and Municipal offices, banks, educational institutions and restaurants



Exhibit 2.8: Reclassification of water body in Nandambakkam Village

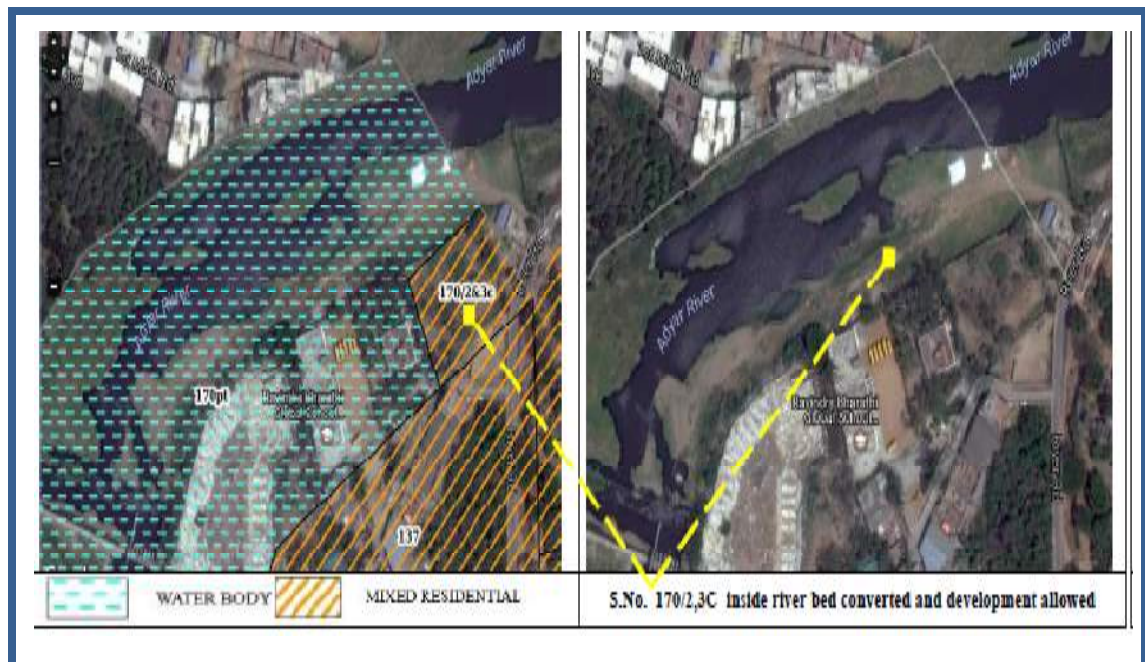
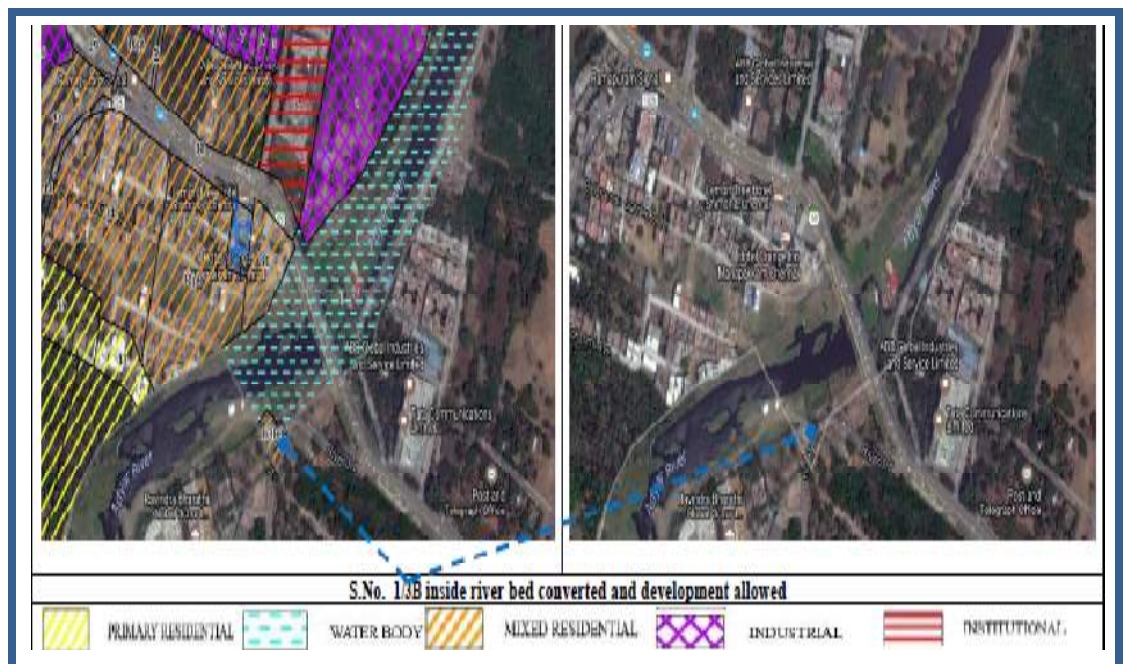
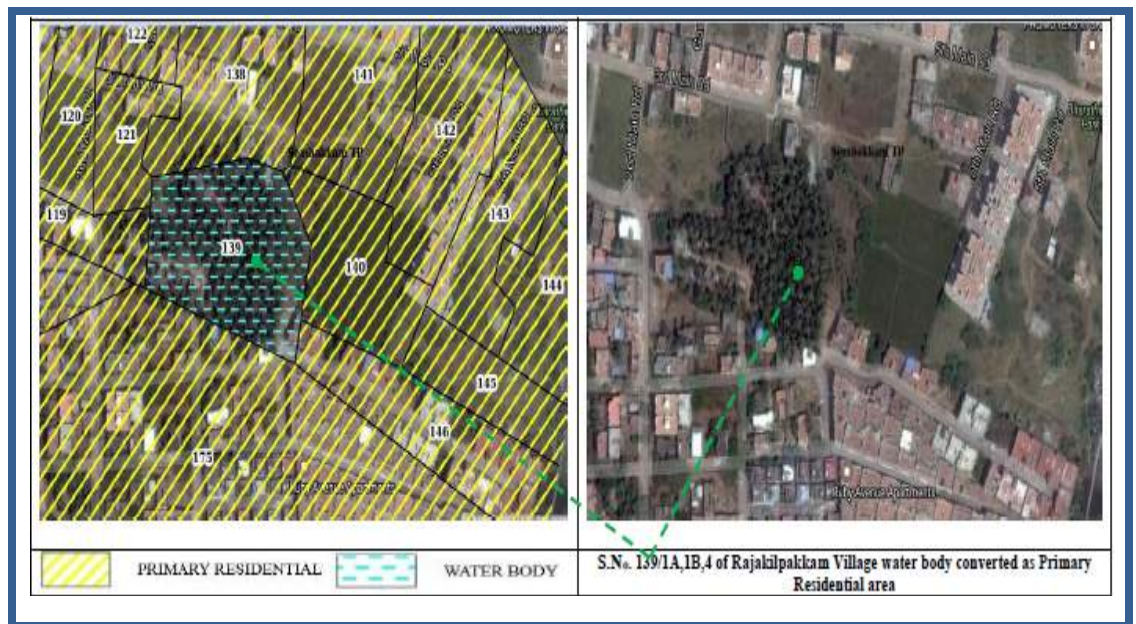


Exhibit 2.9: Reclassification of water body in Manapakkam Village





**Exhibit 2.10: Reclassification of water body in Rajakilpakkam Village in Sembakkam Town Panchayat**



Map not to scale

(Source: Google Hybrid Land use Information System available in CMDA website)

**Exhibit 2.11: Reclassification of water body in Varadharajapuram in Kundrathur Panchayat Union**



Map not to scale

(Source: Google Hybrid Land use Information system available in CMDA website)

We noticed that as per the earliest available Revenue records pertaining to 1912 (Revision Survey and Resettlement Register), all the above lands were parts of water bodies. Revenue authorities sub-divided the Survey number pertaining to water bodies and issued *Pattas* to private individuals over the years, despite a Government order as early as in 1954 banning assignment of water body lands. As such, issue of *Patta* to private persons by sub-dividing water bodies by Tahsildar was in violation of Government orders. CMDA, violating SMP and the stipulated rules and orders, approved conversion of water bodies for residential purposes, treating these *pattas* as ownership title.

Thus, the wrong and inappropriate actions by CMDA in allowing conversion of water bodies and issuing *patta* by Revenue authorities, which was in violation of Government orders, had resulted in loss of natural water bodies and blocking of natural flow of water leading to inundation in all these areas.

***Recommendation No. 8: We recommend the GoTN to impose ban on conversion of water body land and to evacuate and demolish all illegal constructions in water bodies.***

### 2.4.3 Non-preservation of Open Space and Recreational zone

According to SMP, construction in areas declared as ‘open spaces’ is not allowed. The DR specifies the permissible usage of the O&R zone as below:

“All public and semi-public recreational uses and open spaces, parks and playgrounds, zoological and botanical gardens, nurseries, waterfront developments, museums, necessary installations for the above uses are normally permissible. With the special sanction of the CMDA, theme parks and amusement parks, open air theatres, exhibitions, circuses, fairs and festival grounds, public utilities, burial and burning grounds or crematoria, incidental residential/commercial uses for essential staff required to be maintained in the premises, hotels and restaurants not exceeding 300 sq.m., beach cottages each not exceeding 100 sq.m in floor area and 7.5 metres in height, Sports stadia and recreational complexes can also be allowed. All other uses shall be prohibited”.

Agricultural land and areas along a water course were classified as O&R zone to maintain ecological balance and to preserve water bodies.

As per land use policy of 2006, there was 566 hectare O&R land. SMP had prohibited conversion of O&R land for other uses. It was noticed that during the SMP period from 2009-16, 11 hectare of O&R land were reclassified for residential, commercial and industrial purposes in violation of SMP. We examined all eight cases (11 hectare) of reclassification of O&R zone during 2009-16, for residential/industrial purposes, as detailed in **Appendix 2.3**. CMDA approved reclassification by obtaining a certificate from local bodies that there was no proposal for developing any park and play fields in the site reclassified. We observed that there was no Rule or Government order facilitating this action of CMDA in allowing conversion of O&R land by relying on the certificate from local body. CMDA had unilaterally put this system in place to work in tandem with the local bodies in a manner detrimental to the overall interest of preventing O&R land being allowed to be developed. Thus, the action of CMDA and local bodies in these cases was in violation of the stipulations of SMP.

Since the local bodies failed to develop park and playfields in Government lands classified as O&R zone and also could not acquire private lands classified as O&R zone for park and playfields as per DR, the purpose of earmarking O&R zone was, thus, defeated, affecting the smooth flow of flood water to the sea.

***Recommendation No. 9: We recommend that responsibility should be fixed for the lapses in allowing development of O&R zone. We also recommend that the practice of obtaining certificate from local bodies should be stopped and O&R land should not be allowed to be converted.***

#### **2.4.4 Non-preservation of Non-Urban zone**

SMP had classified low lying areas as non-urban zone wherein, all agriculture uses, burning, burial grounds, crematoria and cemeteries, salt pans, brick works, etc., were permissible with usage of electric motors not exceeding 50 HP. Incidental residential uses were permissible with special sanction of CMDA. All other uses were to be prohibited. SMP also stipulated that conversion of non-urban zone for other purposes may be considered after reviewing the SMP after five years depending on the demand. As per the provisions of the TN Town and Country Planning Act, 1971, the Master Plans are required to be reviewed after every five years, but SMP was not reviewed even after eight years.

We observed that CMDA had approved reclassification of 132 hectare (six cases) from non-urban use zone to residential zone during 2009-16, without reviewing SMP, which was required to be done to assess the quantum of conversion from non-urban zone to other purposes. Scrutiny of three cases revealed that nine hectare of land were reclassified by CMDA, subject to conditions laid down by WRD, stating that there was no bar on DR of SMP to reclassify non-urban land for residential purpose. This presumption of the CMDA was against the stipulations of SMP as brought out above.

Thus, CMDA, without any authority, reclassified 132 hectare of non-urban zone for residential/commercial/industrial purposes in an arbitrary manner against the provisions of SMP. The purpose of zoning an area as non-urban in SMP had become redundant. Allowing development in non-urban zone, being predominantly located in low lying areas along river banks, also contributed to the floods which calls for fixing of responsibility.

#### **2.4.5 Non-preservation of catchment areas**

In view of GoTN's decision (1990) to restrict developments to preserve the Redhills catchment area, CMDA resolved (December 1990) (i) to keep all the land classified as Agricultural use zone as it was and not to entertain any request for reclassification in this area (ii) that the Government land in this area to be zoned for O&R use for developing social forestry and (iii) to keep the land classified as Primary Residence and Mixed Residential zone as per the FMP, as they were.

Consequent to the above resolution, CMDA had reclassified land from Institutional, Residential etc., to either agriculture or O&R zones. The SMP had rejected (October 2007) petitions for reclassification of land use in the catchment areas into Residential/Institutional/Industry/Other uses, thus protecting 27 villages in Redhills catchment area.



Despite a decision not to allow development in Redhills catchment area, the land use map showed agricultural land<sup>11</sup> and a water body<sup>12</sup> at Pakkam Village as Primary Residential zone and further developments inside the water body were visible in the GIS land use information map.

To an audit enquiry about developments in catchment area, CMDA stated (November 2016) that the lands at Pakkam Village were zoned as Industrial use in SMP and reclassification of land in Morai Village was approved by GoTN as a special case (November 1998) for construction of quarters for Police personnel. The reply of CMDA was not correct as the reclassification of lands in Pakkam Village as industrial zone in SMP was not legal as per the Government policy. This area was erroneously exhibited in SMP. Government has no authority or justification to relax the policy decision of not allowing any development in Redhills catchment area as a special case which would become precedence for future reclassifications.

The purpose of restricted developments in the Redhills and Puzhal Lake catchments areas, which serves as the major source for city water supply to maintain the area free from possible contamination, was defeated.

Thus, non-adherence to land use planning envisaged in SMP and reclassification of land arbitrarily by the CMDA led to loss of water bodies and land with high water holding capacity, thus contributing to flooding in 2015. As such, there is a need to ensure strict adherence to the policy of not allowing developments in catchment area.

## 2.5 Analysis

The monsoon rains during 2015 were compounded with multiple failures in adopting policies and putting in place suitable plans to mitigate the impact of floods. The State lacked an updated Water Policy to guide plans to minimise the impact of urbanisation on natural waterways. Frequency based flood inundation maps, EAP for dams and basin-wise comprehensive master plans were not in place to respond to challenges posed by heavy rains in an organised and scientific manner. Urban planning lacked legal backing, as the State did not enact the envisaged statute on regulating developments/construction activity in flood plain zone. CMDA, not only repeatedly failed to check large scale constructions along waterways, but also allowed constructions in an unauthorised manner, which choked waterways and altered land uses in the metropolitan area. CMDA's action in allowing conversion of agricultural land without Government's approval, the unauthorised conversion of water body land and non-urban land and the way in which it converted O&R land for various other purposes in connivance with local bodies, indicated the lack of seriousness on the part of CMDA in ensuring planned urbanisation.

<sup>11</sup> Survey Nos. 236, 352/4, 5, 429/1 to 13, 14B, 15B, 24A, 25A, 26A, 28 of Morai village

<sup>12</sup> Survey No.851 which is within the water body (Survey No. 850)