

**BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI**

In

O.A.No.157 of 2016 (SZ)

IN THE MATTER OF:

Marvel River View County
Owner's Welfare Association

...Applicant(s)

With

The Chairman,
Airport Authority of India,
New Delhi and Ors.

...Respondent(s)

Final Repot

Final Report
In
Application No.157 of 2016

Index

Sl.No	Particular	Page No.
1	Status Report	1-7
2	Interim Report (Annexure-I)	8-13
3	Government Order No. 125 Public Works (R2) Department dated 21.07.2009 (Annexure-II)	14-17
4	Public Works Department in its letter dated 31.07.2008 (Annexure-III)	18-18
5	Copy of the PWD report (Annexure-IV)	19-22
6	Copy of the IIT Report (Annexure-V)	23-167

BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

In
Application No.157 of 2016

Final Report

Hon'ble NGT (SZ) vide order dated 20.02.2020 in Application No.157 of 2016 constituted a Joint Committee comprising of (1) a Senior Officer of MoEF & CC, Regional Office, Chennai (2) Executive Engineer, PWD (3) District Collector, Kancheepuram and (4) Tamil Nadu Pollution Control Board to inspect the area in question and enumerate the violations and its impact and whether the violations can be remedied by providing precautionary measures and if not, what are the things to be done and any further action to be taken by the MoEF on this aspect.

Thereafter vide order dated 17.06.2020 in Application No.157 of 2016 the Hon'ble NGT(SZ) modified the committee by substituting the District Collector, Chengalpet District instead of District Collector, Kancheepuram and directed to submit the Report on or before 29.9.2020.

In this regard the Joint Committee has inspected the site on 25.9.2019 along with the Complainant and an Interim report has been filed before the Hon'ble Tribunal. Copy of the Interim report is attached as **Annexure-I**.

During the inspection the complainant has briefed about the violation made by Airport Authority of India while constructing the bridge across the river and informed that his concern is only about the bridge. Accordingly the Joint committee members along with the complainant with the help of AAI Officials inspected the bridge in line with the concern raised by the complainant.

The worry of the complainant was if any flood similar to 2015 will occurs in future, their residence might have sink as happened in 2015 flood. He also informed that before or after 2015, flood has not affected them. In view of this the Joint

committee requested the PWD, Tamil Nadu, one of the joint committee members to go through the concern raised by the complainant and to submit the factual report for ascertaining the violation in the construction of bridge if any occurred.

Accordingly PWD informed that, as per the drawing of newly constructed runway/bridge across the Adayar river obtained from AAI reveals that, the top level of the runway is (+)12.20m and soffit of the bridge is (+)11.00m. In order to verify this, the levels have been taken from the permanent Bench Mark at Manapakkam check dam crest level (+)4.750m and GTS Bench Mark at St. Thomas Mount Church (+)23.878m. It shows that the present soffit level (Bottom of the bridge) of bridge is (+) 11.00m as recommended by the Public Works Department in its letter dated 31.07.2008 and in Government Order No. 125 Public Works (R2) Department dated 21.07.2009 that the soffit level of the bridge deck slab shall have a minimum clearance of 0.50m above the Maximum Flood Level of 10.50m ($10.50+0.50=11.00\text{m}$). (Copy of the Order dated 21.07.2009 and letter dated 31.07.2008 is at **Annexure-II and III**)

It is also stated that, even though the original river width in the subject area is 130 meters, the Public Works Department already insisted to construct 200 meters length of bridge to ensure the width of river as 200 metres for the free flow of water and the same was carried out by AAI.

During the historical rainfall occurred in the year 2015, the Maximum Flood Gradient Level realized in the subject area is (+)13.39m which is nearly 2m above the runway level. Thereafter no such hike in the Maximum Flood Gradient Level was occurred.

The Public Works Department in its letter dated 31.07.2008 and in Government Order No. 125 Public Works (R2) Department dated 21.07.2009 has given no objection certificate with the condition that

"...4) soon after the construction of bridge for the secondary runway and parallel runway across Adayar River, the covered area becomes restricted zone and hence the Airport Authority should take care of the periodical maintenance including the desilting works of Adayar River within their boundary, otherwise shall remit the cost of Public Works Department for undertaking the annual maintenance works.....".

The PWD suggested that 1000m upstream and downstream of the newly constructed bridge should be desilted and the vegetations should be removed before the monsoon of every year to ease the flow of river in the subject area. For security reasons, the maintenance in the river stretch underneath the bridge should be done by M/s AAI periodically. (Copy of the PWD report is at **Annexure-IV**)

In response to the unprecedented floods of December 2015, AAI of Chennai approached IIT Madras to do a comprehensive scientific analysis of the drainage system in an around the Chennai airport and the flood carrying capacity of Adayar River to propose improvements that would minimize the magnitude of flooding and if feasible eliminate it, if similar rainfall event were to recur in the future.

Accordingly a comprehensive scientific analysis of the drainage system in and around the Chennai airport and the flood carrying capacity of Adayar River have been carried out by IIT, Chennai. (Copy of the IIT Report is at **Annexure-V**).

These studies were carried out with an objective as follows:

- (1) To understand the reasons of the airport flooding during December 2015
- (2) To propose improvements that would minimize the magnitude of flooding and if feasible eliminate it, if similar rainfall event were to recur in the future and
- 3) To suggest improvements to the airport storm drainage system for disposing of nuisance floods and floods caused by storms of 1 in 10 year return period.

Salient findings of the study are the following:

- (1) The flooding of the airport during the December 2015 was due to much large regional extent of the storm that brought flood waters from about 680 sq.km area upstream of the airport, including reservoir release from Chembarambakkam, and not necessarily due to the local flood waters from about 50 sq.km area in the immediate vicinity of the airport. Hence, any flood prevention measures at the airport has to comprehensively look at the regional topographical features to develop appropriate flood control measures.
- (2) The magnitude of the floods of December 2015 is only slightly less than the flood magnitude caused due to 1 in 100 year design storm which is as much as 3.5 to 4.5 times (350% to 450%) more than the bank full carrying capacity of the river at the bridge site. The bank full capacity of the river at the runway bridge at the soffit level of 10.5m was found to be range between 1,104 m³ /s (38,985 ft³ /s) and 1,409 m³ /s (49,774 ft³ /s) depending on the channel roughness.
- (3) The hydraulic models indicate that the bridge piers of the runway bridge across Adyar River do not have any noticeable impact on the flood carrying capacity of the river at this section.
- (4) The December 2015 flood is a flood of unprecedented magnitude. Any structural interventions to deal with floods of such magnitude will be massive. Hence, in order to keep the size of structural interventions within a reasonable level, a recurrence interval of 10 year may be adopted. Federal Aviation Administration (FAA) of the United States recommends that the storm drainage structures within the airport can be designed for a design storm with return period of greater than or equal to 5 years. Hence, a 10-yr design storm for designing storm drainage structures within the airport would suffice.
- (5) Dredging, widening and clearing of the river bed U/S of the runway bridge has minimal impact on the river discharge capacity. However, dredging,

widening and clearing of the river section to a length of about 3km D/S of the runway bridge site, including widening of the OTA bridge, increases the river discharge capacity by 25% (increased discharge of 300 to 400 m³ /s).

(6) Flood bypass channel near the runway bridge site does not increase the flood discharge capacity considerably. Hence, this is not a viable option to increase the flood discharge at the bridge site

(7) Flood carriage way from Chembarambakkam in Adyar to Vallipuram in Palar could carry only a maximum discharge of about 391 m³ /s due to its mild gradient (6.5 cm drop over a 1km length). This channel will have a top width of 100m, depth of 4m over a length of 75 km. As the flood carrying capacity is not much, considering the environmental, economic and social implications, the option does not seem viable. However, a flood carriageway such as this is required as more urbanization to the west of Tambaram would bring more flood waters into the airport and into the Chennai city. Hence, this option needs to be comprehensively investigated in greater detail.

(8) All the airport drains begin to backflow with water from Adyar River due to the higher water level in Adyar even for floods caused by 2-yr and 5 yr return period design storms.

(9) Storm drains from external drains bring considerable amount of flood water from the neighboring into the airport premises due to urbanization over several decades since the airport construction. Further, about 9.7km of 36km of internal drains were found to surcharge for a design storm of 1 in 10 year return period. Hence, there is a need to consider resizing and rerouting both internal and external storm water drains.

Based on the IIT study, the recommendations are the followings:

(1) Dredging, widening and clearing of the river section for 3km D/S of the runway bridge site till the check dam before Miot hospital

(2) Checking the design of the airport compound wall for withstanding the static and dynamic pressure of the water encountered during the floods of 2015 to prevent from collapsing in future from similar floods

(3) Resizing and rerouting of internal storm water drains to prevent or minimize surcharging from 1 in 10 year design storms

(4) Resizing and rerouting of external storm water drains from the Pallavaram and Pammal area through Cowl Bazaar into Adyar River to minimize flooding inside the airport premises and at the same time improve storm drainage infrastructure outside the airport region

(5) Equip storm drains with sluice gates to prevent flooding from backflow of water from the Adyar River; along with the sluice gates, install pump houses and sumps at two critical places to quickly drain the airport region during times of extreme floods

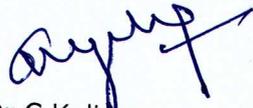
(6) Critical infrastructure such as ILS and Radar stations needed to be lifted up to a minimum height of 15m above Mean Sea Level or be equipped with deployable temporary flood barriers to prevent any damages from the water. Based on these recommendations, DPRs may be prepared for relevant components where more detailed design is necessary for successful execution of the project.

Conclusion:

Even though the original river width in the subject area is 130 meters, the AAI has constructed 200 m length as insisted by Public Works Department to ensure the width of river as 200 metres for the free flow of water. This has helped to retain the flood carrying capacity of the River at this section.

The study of IIT Madras also indicates that the bridge piers of the runway bridge across Adyar River do not have any noticeable impact on the flood carrying capacity of the river at this section.

In view of this the Joint Committee recommends to desilt 1000 m upstream and downstream of the newly constructed bridge and to remove the vegetations every year before the monsoon to ease the flow of river in the subject area. It is also prayed that, the Hon'ble Tribunal may direct the state/local body to consider the feasibility in implementation of the recommendation made by the IIT based on the detailed study.



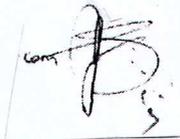
Dr.C.Kaliyaperumal
Director
MoEFCC



Dr.Sridhar
Scientist 'D'
MoEFCC



Dr.K.G.Prijilal
Research Officer
MoEFCC



Er. S.Vijayarajan
District Environmental Engineer
TNPCB



Er. C. Pothupanithilagam
Executive Engineer,
PWD, WRD



Shri D.Ravichandran
Revenue Divisional Officer
Tambaram