

Item Nos. 3 & 4

(Court No. 1)

**BEFORE THE NATIONAL GREEN TRIBUNAL  
SPECIAL BENCH**

(By Video Conferencing)

Original Application No. 04/2013(SZ)  
WITH  
Appeal No.18/2017(SZ)

C. H. Balamohan

Applicant

Versus

Union of India and Ors.

Respondent(s)

Date of hearing: 11.04.2022

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON  
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER  
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER  
HON'BLE MS. JUSTICE PUSHPA SATHYANARAYANA, JUDICIAL MEMBER  
HON'BLE DR. SATYAGOPAL KORLAPATI, EXPERT MEMBER  
HON'BLE PROF. A SENTHIL VEL, EXPERT MEMBER**

O.A. No. 04/2013(SZ)

For Applicant(s): Mr. A. Yogeshwaran, Advocate

For Respondent(s): Mr. G.M. Syed Nurullah Sheriff, Advocate for R1 & R5.  
Dr. D. Shanmuganathan, Advocate for R6 to R8.  
Mr. V. Balamurugan and Mr. Alex, Advocates for R9, R10, R12,  
R20.  
M/s. Suvitha, Advocate for R13.  
Mrs. Madhuri Donti Reddy, Advocate for R16.  
Mrs. V.K. Rema Smrithi, Advocate for R17.

Appeal No. 18/2017(SZ)

For Appellant(s): Mr. A. Yogeshwaran, Advocate

For Respondent(s): Mr. G.M. Syed Nurullah Sheriff, Advocate for R1 & R2.  
Dr. D. Shanmuganathan, Advocate for R3.

**ORDER**

1. This order will deal with O.A. No. 04/2013(SZ) and Appeal No. 18/2017(SZ) as the both matters involve common issue of protection of stretches of coastal line affected by the human induced erosion caused by hard structures.

## **Introductory**

2. O.A. No. 04/2013(SZ) was filed on 17.01.2013 raising the grievance of destruction of Puducherry and Tamil Nadu Coastal Environment due to construction of hard structures causing continuous erosion of the coast. It is submitted that not only the stretch in question but most parts of Indian Coastline - both on the East and West Coasts are under the influence of the Littoral Drift.

3. Appeal No. 18/2017(SZ) has been preferred against CRZ Clearance dated 06.10.2016 granted by the SEIAA, Tamil Nadu for proposed construction of series of 19 Groynes from Ennore to Ernavoorkuppam in Madhavaram Tuluk of Tiruvallur District, Tamil Nadu, by the Public Works Department (WRD). **The clearance has been granted subject to orders of this Tribunal in OA04/2013.** The said appeal was filed on 28.2.2017 and was admitted for consideration on 10.03.2017. To appreciate the issue involve, we may refer to some of the averments in the O.A.

## **Main contentions of the Applicant/Appellant**

4. According to the applicant there is large scale human induced erosion and destruction. The Littoral Drift varies from one coastal compartment (or sediment cell) to another. Within each of these coastal compartments, the undisturbed coastal environment and habitat is usually in a state of equilibrium. For such a state of equilibrium to exist within a coastal compartment, the "sedimentary budget" within a compartment needs to be maintained. The sedimentary budget is something that has been arrived at and is determined by the prevailing natural phenomena along a particular coast. Just like the water level in

a river is maintained and determined by the "water budget" of its catchment area, similarly the "sediment budget" of the "river of sand" along the coast is determined by the related factors within its sediment cell.

5. When the "sedimentary budget" within a coastal compartment is disturbed and upset, i.e. when the natural movement of sand is disturbed and interrupted for example by man-made coastal structures, a cascading effect takes place along the shores of a given sediment cell. When a coastal structure is erected in the path of the freely moving sand along the coast, the structures prevent the natural flow of sand in the same manner as a dam across the path of river interrupts the flow of water. In such an instance one part of the coast gets an excess of sand and the other side on the down-drift is starved of sediment. The side that is starved of sediment starts and keeps eroding as long as fresh input of sand is not provided.

6. Because coastal compartments and sediment cells are large, often larger than artificial boundaries such as politically determined state boundaries, one sediment cell may overlap two neighboring states. This is particularly true along the East coast of India, where for instance stretches of coastline of the States of Tamil Nadu and Puducherry are part of the same coastal compartment and sediment cell. This is particularly relevant in the case of Puducherry as its territory is fragmented and surrounded by the territories of Tamil Nadu. Thus, if the sediment budget within a coastal compartment that is shared by two states is upset, the impact of such interference will be felt across states.

7. The environmental destruction caused by the construction of hard structures on the coastline which negatively affect the coastal

processes, the environment and the communities is a problem that is not confined to either the Union Territory of Puducherry, or to the State of Tamil Nadu. Rather, it is a situation in which the negligence and/or mismanagement of one government causes destruction both within its own jurisdiction and within the neighboring jurisdiction. Because **the damaging effects of these hard structures transcend state and union territory boundaries**, responsibility for preventing such damage rests equally with the Union Government of India, as well as with the governments of the Union Territory of Puducherry and Tamil Nadu.

8. The Puducherry Region of the Union Territory of Puducherry and large parts of the Tamil Nadu coastline, are situated on the east coast of India which has a sandy coastline and is therefore vulnerable to human-induced change and is thus ecologically sensitive and fragile. The coastal geomorphology and related ecosystems play a large and vital role in the economic development of the region, providing a large number of functions and services, from sustaining ecology, traditional fishing communities to attracting visitors to Puducherry's tourism industry. The severe and rapidly worsening coastal erosion is damaging the subsistence based, sustainable and lucrative sectors of the local economy making the affected region increasingly ecologically, socially and economically vulnerable.

9. Over the past two decades, Puducherry has suffered large scale coastal erosion induced by imprudent, ad hoc and unscientific construction of hard structures on the coast which have a constant, negative impact which is felt and aggravated with every single day that goes by. This problem of human-induced coastal erosion has not been addressed by the Government of Puducherry. Instead, the coastal

management measures adopted so far have only transferred and aggravated the problem of erosion down the coast to the neighbouring state of Tamil Nadu which has been facing the same ever-increasing problems of human-induced coastal erosion since over a decade.

10. The problem of large scale and rapid coastal erosion in Puducherry started in and around 1986 with the construction of an artificial harbour in Ariyankuppam estuary, situated 1.5 km to the south of the Puducherry town. The harbour was meant to provide an artificial channel from the open sea into the Ariyankuppam estuary to provide a safe entrance for barges and other sea-going crafts. The Harbour was finally commissioned in 1993.

11. To keep the mouth of the harbour open to the sea, two breakwaters were constructed to the south and north of the harbour mouth, at either side of the Ariyankuppam estuary. As a result, the northward flow of sediment along the coast was blocked at the southern breakwater, starving the coast to the north of the harbour of sand and causing severe erosion of the coast. The construction of breakwaters in the Puducherry harbour thus commenced the process of coastal erosion and, as a consequence, several kilometres of beach in Puducherry Town has been completely lost.

12. The process of massive erosion caused by the harbour construction was not unexpected. To the contrary, it was expressly anticipated by the studies and recommendations by Centre for Water, Power and Resource Studies ("CWPRS") and Consulting Engineering Services Private Limited ("CES"), which advised the Government of Puducherry while the project was still in the planning stage. Those studies accurately predicted that the breakwaters at the harbour

entrance could cause massive erosion to the north of the harbour, as the structure would block the natural, incessant migration of sand. The studies further predicted that sand would accumulate to the south of the breakwater and the harbour entrance would silt up due to littoral drift. The consultants warned that constant maintenance and dredging was required to clear the harbour mouth, to keep it open. The studies recommended that sand dredged from harbour mouth must be used for sand nourishment to the beaches north of the harbor in order to mitigate the negative impacts caused by the blockage of sand by the harbor breakwaters. The consultants further concluded that continuous sand by-passing -whereby sand blocked and accumulating at the southern breakwater would be mechanically transferred across the harbor mouth and allow it to resume its northward flow up the coast - was required to prevent and mitigate erosion of the coastline north of the harbour, where the town of Puducherry Town as well as several fishing hamlets are situated. An elaborate system of mechanical sand by-passing with dredgers to pump sand from the south side of the harbour to the north side, was therefore adopted when the port was constructed in order to mitigate the negative impacts of coastal erosion.

13. The planned process and system for mitigation which consisted of mechanical sand by-passing and beach nourishment was never efficiently operated by the Government of Puducherry as the system was never fully or properly implemented. Since 1993, when the Ariyankuppam harbour was formally commissioned and became fully operational, it is estimated that out of the total amount of maintenance dredging to be undertaken by the Government of Puducherry, less than about 25% of the total required volume of sand has been dredged till now. However, less than that (it is estimated about 50%) was used to

nourish the beaches as the dredged sand was instead wrongfully either used for land reclamation, disposed of into the deep sea or pilfered by illegal sand miners. As a consequence, the massive human-induced erosion predicted by CWPRS and CES occurred precisely as they said it would, completely wiping-out 10 kilometres of beautiful and important sandy beach along the historic promenade of Puducherry town, the fishing hamlets of Kuruchikuppam, Vaithikuppam, Solai Nagar in Puducherry and the fishing hamlets of Soudanikuppam, Nadu Kuppam, Thandirayan Kuppam and Chinnamudaliarchavadi Kuppam in Tamil Nadu. Other coastal communities further to the north are also witnessing the shrinking of their beaches as the human-induced erosion threateningly moves northwards.

14. In 2002, long after the beach in Puducherry town had disappeared, following several representations made by members of the civil society as well as by experts, the Government of Puducherry instituted a program of sand by-passing and artificial beach nourishment, using sediment dredged from the harbour to provide northward flowing sand. Within a short period of time, small areas of beach began to re-form adjacent to the town. However, unfortunately this program was not sustained and the new areas of beach quickly disappeared when artificial beach nourishment ended.

15. The massive erosion process unleashed by construction of the harbour did not stop with the evisceration of the sand beach. Without the presence of the beach and its corresponding off-shore sand bar, the waves which once formed some distance from shore and broke gently on the slope of the beach now crashed directly onto the once-dry land. Goubert Avenue, more commonly known in Puducherry as "Beach

Road", which runs for 1.5 kilometres along the shore where the sandy beach used to stretch, was threatened as the land beneath it was undermined by the ongoing erosion. Because of scouring of sand below the promenade, the road started to crack and crumble and had to be entirely re-laid.

16. With the natural flow of sand blocked at the harbour and the system of sand bypass neglected, the erosion which eliminated the beach now threatened the very heart of Puducherry town, including the very government offices, the Chief Secretariat, in which the decision to build the ill-considered harbour was originally taken. Instead of activating the sand by-passing system to mitigate the erosion and nourish the beaches as originally intended, the government of Puducherry chose to create a rip-rap seawall along Beach road, dumping crores of tonnes of massive rocks, trucked-in from quarries in Tamil Nadu to "defend" the town against further erosion.

17. In August 2001, a Preliminary Report Submitted by NOIT-IIT to the Govt. of Puducherry proposed the construction of groynes along the coast of the Puducherry Town. This proposal was opposed by members of civil society groups as it was deemed to be detrimental to the coastal environment. A second opinion on the proposed project was sought by the Government. This proposal was subsequently shelved and thankfully never saw the light of day.

18. A groyne is an impermeable wall extending perpendicularly from land into the sea. Along the Puducherry coast the objective of a groyne is to capture the northward-moving sand along the southern side of the groyne. Indeed, tiny scalloped beaches have formed along the massive groynes; but these small gains have come at an enormous cost. Just as

the breakwater at the harbour trapped sand to the south and caused massive erosion to the north, the groynes rapidly accelerated the northward process of coastal erosion.

19. Clearly, groynes were faulty as a solution as they would only succeed in moving erosion northwards and were no substitute for beach nourishment. Several groups were opposed to this wasteful and environmentally unsustainable exercise and sought scientific opinion to buttress what was clearly common sense. In October 2001 DELFT TECHNICAL UNIVERSITY in their expert opinion to INTACH, Pondicherry on NIOT's proposal stated that the NIOT's proposal did not prevent structural erosion in the area north of the groyne field nor did it take away the causes of siltation of the harbour entrance. The University further suggested that more studies were needed to be undertaken, an Integrated Coastal Zone Management Plan had to be prepared and alternative solutions such as sand bypassing and beach nourishment to mitigate the coastal problems was to be explored. Although all of this information and suggestions were shared with concerned Government authorities no suitable action was taken.

20. In April 2002, a civic group called Citizens Forum of Pondicherry also raised objections to this proposal. The construction of groynes was opposed as the groynes would merely transfer the erosion northwards and not solve the root cause of the problem, the disruption of the littoral drift by the harbour. They instead suggested that detailed studies should be undertaken which included the redesigning of the harbour entrance. They also objected to the NIOT/IIT's concept of conducting trials in the Ocean at the detriment of the environment. Heeding to all

this criticism, the Government of Pondicherry sought a second opinion from Danish Hydraulics Institute (hereinafter referred to as "DHI").

21. Subsequently on October 2002, a Coastal Erosion Study was conducted by Study Group CF01 of DHI and they concluded as follows:

- Sand by-passing is the best solution.
- Construction of groynes is not a favorable solution.

The Study Group also recommended that:

- Viability of the harbour project was to be investigated.
- Preparation of an ICZMP.
- Dredging and by-pass were to be monitored closely.

DHI proposed to:

- Conduct site visit and review data.
- Assess annual sediment balance.
- Conduct preliminary design of Port entrance.
- Optimize port entrance layout.
- Prepare design for shoreline management scheme.
- Prepare guidelines for dredging and re-nourishment.

22. However, no suitable action was taken. Between 2002 and 2003, the Government of Puducherry constructed 6 kilometres of seawall along the Puducherry coast, at a cost of several crores of rupees. The decision to abandon the planned and existing mitigating measures of sand by-passing and beach nourishment in favour of seawalls were undertaken without conducting any detailed, comprehensive studies and were therefore undertaken on a purely ad hoc, arbitrary and unscientific manner. The construction of seawalls was undertaken in total disregard of the observation and recommendations made by Dr. Z.S. Tarapore and Dr. Vaidyarannan both erstwhile Directors of the CWPRS which were fully familiar with the design of the Puducherry harbor and Ariaynkuppam.

23. On 21 February 2003, Mr. P.P. Vaidyaraman, retired director of CWPRS, who was part of the design team of the Puducherry harbor at Ariyankuppam wrote to the GoP following his visit to Puducherry shortly after sand by-passing and beach nourishment had been undertaken at the Puducherry harbor. Mr. Vaidyaraman was not only extremely pleased with the results of beach nourishment, but also made several suggestions for the continuation of sand by-passing and beach nourishment which he stated should be replicated at several of the other Indian ports as well. However, few of his suggestions were implemented.

24. While the "hard structure" of the seawall has had the limited superficial effect of keeping the erosion from penetrating onto Beach Road, it accelerated two other erosion processes. First, the surf which now crashed against the hard barrier of the seawall carved-out and scoured the sea floor that was once safely beneath the sand beach. This would come to have dire effects on the quality of the drinking water in Puducherry, creating a short path for saline intrusion into the town's aquifers. It would also prevent any future beach from forming along that stretch of coast because the sea floor was now too deep and unstable to retain migrating sand, even if it had been allowed to flow as nature had intended.

25. The second erosion process accelerated by the seawall was to the north of the construction. At the end of the hard structure, the long shore currents form a powerful eddy, scooping-out the "unprotected" land in deep pockets of erosion. Thus began a vicious cycle of erosion and defense, more-erosion and more defenses. As the seawall transferred and spread the problem of erosion northward up the coast,

more and more beach was lost, more village land fell into the sea, and the disaster migrated further-and-further. Puducherry's coastal erosion problem had now become Tamil Nadu's problem as well.

26. In 2003 Tamil Nadu PWD initiated its own "hard structure" protection measures, in response to the erosion to its fishing villages caused by the hard structures built by its southern neighbor. Seawalls were built in Nadukuppam, then in Sothanaikuppam during 2005-2006, as the coastal erosion was forced northward. Today, these seawalls extend all the way to Kottakuppam and Chinnamudalaiyar Chavadi and Tamil Nadu is passing the problem back to Puducherry, as the erosion now reaches the Union Territory enclave at Pillaichavadi and beyond.

27. The fishing villages along the coast to the north of Puducherry town lost more than just beach and village land as the erosional process crept northward. They also lost their industry. As the seawall lengthened, fishermen could no longer launch their traditional skiffs and catamarans. The beaches from which they launched their boats into the sea and landed their catch back on land were gone. It is impossible to launch from the steep seawall, which has waves crashing hard against it. The loss of the beach space has also affected the livelihoods of the fishing communities in several other ways as the beaches are also used to dry fish, repair nets and carry out several other related activities. Fishing communities complained to the Government of Puducherry that without beaches to fish from, their livelihoods were lost.

28. In 2004, Dr. Z.S. Tarapore, retired director of CWPRS, who was part of the design team of the Puducherry harbor at Ariyankuppam wrote to the GoP following his visit to Puducherry and warned the GoP against construction of groynes. He warned that the construction of groynes was a "dangerous proposition" since the groynes would only transfer the problem of erosion further down drift, where there were heavily populated areas. Among other things he suggested to undertake "a massive nourishment programme" to control the problem of erosion to the north of the harbor. During the same time, in his address to the 6<sup>th</sup> CPDAC (Coastal Protection & Development Advisory Committee of the Central Water Commission), in the year 2004, the problem of erosion was discussed and it suggested that groynes and seawalls were not the answer. The erstwhile Chief Secretary of Puducherry advocated that "cost-effective and environment friendly technologies" should be adopted to address the on-going problem of erosion. During the 10<sup>th</sup> CPDAC meeting it was once again emphasized that "coastal protection works and the coastal zone management should go together since one had impact on the other. Also, the States should not think only of the sea walls as a protection measure to protect the shoreline but also adopt other new technologies which preserve the beaches and ecology as well."

29. In 2004, the Tsunami struck the East coast of India. The coastal populations of the Puducherry region did not suffer much damage as most of the inhabited areas were located in areas that were in significantly elevated from the level of the sea. However, with an abundance of funds flowing into the Government's coffers, as a knee-jerk reaction and a populist measure, large amounts of money were

spent to enlarge the seawalls along the Puducherry coast instead of spending those funds on the much required and planned beach nourishment that would have restored the beaches and protected the Puducherry town and coastal villages more effectively against any future Tsunamis.

30. In spite of expert views on the dangers of constructing groynes and the necessity of conducting detailed studies off the coast, the PWD drew a fresh proposal to construct groynes along the Pondicherry coastline. In November 2006, a 50 m long groyne was constructed just adjacent and north of the New Pier. From enquiries it was learnt that this groyne was built without any environmental clearance and its construction was abruptly halted upon enquiries.

31. Notwithstanding the severe erosion along the coasts of Puducherry, the Government of Puducherry did not resume the dredging and sand bypass operations that might restore some portion of beach to its coastline. Instead, under pressure from fishing villages to artificially recreate sandy beaches from which to fish, both the Government of Puducherry and the Government of Tamil Nadu began building groynes at intervals along the coast in 2005.

32. In April 2007, the Government of Tamil Nadu constructed two large groynes at Thandirayankuppam. The southern groyne is 100 m long and the northern groyne is 170 m long. These groynes triggered severe erosion of the coastline to the north. About 70 m wide beach was lost in the same year to the north of the groyne. Since the construction of these groynes, about 2.5 acres of beach has been lost severely affecting the villages of Chinnamudaliarchavadikuppam and Bommayarpalayam.

The village of Chinnamudaliarchavadikuppam lost several homes as a result of the human-induced erosion. Several other private and public properties have also been damaged.

33. On 20<sup>th</sup> July 2007, members of civil society groups met the officials of PWD & Port Secretary, Mr. Anbarasu and discussed the urgency for the Pondicherry Government to resume dredging and sand nourishment activities at Pondicherry Harbour entrance. When queried about the status of the proposed construction of groynes, Mr. Anbarasu stated that there was no definite proposal and he was seriously considering dredging and sand nourishment.

34. In July and August of 2007, elected representatives from the seven fishing villages of Anichankuppam, Chinnamudalyarchavady, Koonimedu, Mudhaliarkuppam, Nadukuppam, Notchikuppam and Pudhukuppam, which are located in the Kottakupam and Marakanam Blocks of the Villupuram District wrote to the Hon'ble Chief Ministers of Puducherry and Tamil Nadu and also submitted resolutions to inform them about their plight caused by the human induced erosion of the coast and also demanded that the beaches in front of their villages be restored so that they may pursue their livelihoods. Being located to the north of Puducherry and seeing the human induced erosion spread towards their beaches they were understandably deeply concerned about the future of their coastal environment and their livelihoods that depended on it. However, no action was taken to fulfill their demands and needs.

35. Following public outcry by several environment groups the construction of other groynes that were also planned was stopped. On

Nov. 3<sup>rd</sup> 2007 a public consultation meet was held in Auroville between Government officials of Puducherry, Tamil Nadu in the presence of experts (Governmental and Nongovernmental) and civil society groups. The following solutions and measures were unanimously agreed upon and proposed:

**Immediate —**

- a. Activate sand by-passing system for nourishment and restoration of beach immediately north of Puducherry harbor.
- b. Undertake model studies urgently to arrive at the best method of restoring the eroding beaches of Puducherry and Tamil Nadu. Study the impact of groyne fields with and without artificial nourishment, before embarking on new measures
- c. Remodel the harbour entrance for maximizing natural sand by-passing:
  - i. Initially for the existing fishing harbour
  - ii. Later for proposed deep water commercial harbour

**Long Term:**

- d. Restoration to include artificial nourishment, as universally accepted
- e. Investigate off-shore sand deposits for nourishment
- f. Identify suitable sand nourishment equipment to operate in wave environment

**Administrative:**

- g. Coastal Zone Management Authorities (CZMA) of Tamil Nadu and Puducherry to coordinate and take up the issue of coastal erosion jointly

h. Initiate Puducherry component of Integrated Coastal Zone Management Plan (ICZMP), in conjunction with Tamil Nadu's ICZMP.

i. Funds to be provided for modeling and hydrographic survey

36. On 7<sup>th</sup> December 2007, Mr. C.V. Shankar, IAS, Officer on Special Duty (RR) & Project Director (ETRP & TEAP), GoTN who had attended the consultation meet on 3<sup>rd</sup> Nov. 2007 wrote to the GoP with regards to proposed construction of groyne filed from Kuruchikuppam to Solai Nagar. He requests that this should be undertaken only after the preparation of a comprehensive plan for the coastline, that is sustainable, livelihood sensitive and eco-friendly.

37. On 26<sup>th</sup> December 2007, the Pondicherry Government inaugurated Capital Dredging, to be taken up at Harbour Entrance. However, when the capital dredging operations began it was shockingly and disappointingly learnt that the dredged sand was being disposed of in deep waters, off shore outside the littoral zone and not used for beach nourishment. Ironically, during the inauguration of capital dredging operations that was held with much fanfare at the New Pier premises, large banners publicizing Beach Nourishment were displayed in spite of the fact that no beach nourishment was being undertaken.

38. On 27<sup>th</sup> December 2007, members of civil society held meetings with the Port Director of Pondicherry and expressed disappointment that the sand dredged from the harbour entrance was being dumped into the deep waters instead of being used for beach nourishment. Members of civil society met the officials of Pondicherry port and the

Secretary, PWD on 28<sup>th</sup> December 2007 on the issue of sand nourishment not being undertaken. The officials promised to look into the issue but however on 1<sup>st</sup> January 2008 the construction of groyne at Kuruchikuppam was resumed without any environmental clearance.

39. In January 2008, representations were made to the Secretary, MoEF about the on-going problem of human-induced erosion along the Pondicherry-Tamil Nadu coastline. The Secretary wrote to the GoP asking them to discuss matters of erosion with GoTN in order to find a viable solution and save the beaches. In total disregard of the observations, recommendation and conclusions of the Nov. 2007 meet, the Govt. of Puducherry initiated a project of construction of groynes along the coast of Kuruchikuppam and Solai Nagar. With construction of groynes continuing to damage the coastline, Jesuratinam, convenor of Coastal Action Network from Nagapattinam filed a writ petition in the High Court at Chennai (W.P. No.1452 of 2008) seeking a Writ of Mandamus, directing the Government of Puducherry (a) to forbear from constructing groyne fields in the coastal region of Puducherry, (b) to conduct appropriate scientific studies for development of a sustainable and comprehensive coastal management plan for the restoration of the Puducherry/Tamil Nadu coastline, and (c) to frame a suitable scheme to ensure that the natural movement of sand is restored so that the coastal areas of Puducherry and Tamil Nadu are protected from erosion. The Government of Tamil Nadu was also a respondent to that petition.

40. This writ petition was disposed on 13 February 2008, after the learned pleader for Government of Puducherry declared in open court

that the activity of construction of groyne field would not be undertaken without the prior permission from the Ministry of Environment and Forestry, Government of India. On this representation by the Government of Puducherry, the High Court dismissed the petition and made no orders with respect to the incidental and ancillary prayers. However, contrary to the undertaking given in Court, construction has begun without obtaining environmental clearance, causing grave irreversible damage.

41. Following the above writ petition, the MoEF constituted a three member committee to visit the Puducherry site proposed for groyne construction. The Committee visited Puducherry on 11<sup>th</sup> and 12<sup>th</sup> June 2008 and subsequently reported that as a long-term measure, the GoP should seriously consider sand by-passing of the required amount of sand as this was likely to mitigate the problem of erosion. The committee also suggested that a study covering both Puducherry and adjacent Tamil Nadu coast should be undertaken by a reputed organization. Neither of these have been implemented so far.

42. At the national level, coastal erosion has also been become an increasingly pressing issue with every coastal state facing some form of coastal erosion or the other.

43. In April 2009 the Asian Development Bank prepared a report for itself and the Government of India for India's sustainable coastal protection and management. In this report, the following significant points are made:

**Change of philosophy:**

"The change to sustainable and soft engineering measures for protection needs to be supported by an effective institutional framework including the Government at different levels, communities and also the private sector. To achieve the necessary levels of support requires a shift in Government policy with a clear mandate for the concerned organizations. A key technical issue is the diagnosis and identification of appropriate solutions for coastal protection works. The projects presently being implemented in the states are based almost entirely on the continued expansion and rehabilitation of rock protection works. This type of development is and will continue to have very serious environmental and social implications. There is a need to completely reshape the approach and philosophy to planning, design and implementation of coastal erosion works. Soft solutions for erosion control are now well developed and are already beginning to be implemented in India. There is need to help and guide a well-planned and programmed transition process as well as ensure the planning and designs for the proposed investment program meet the highest standard of environmentally and socially appropriate solutions. There is also a need to identify and address the causes of erosion, frequently these are manmade and the most appropriate solution is to address the cause rather than the effect. This requires an integrated and coordinated approach to the planning and development of all coastal infrastructure and shoreline uses."

**Sector assessment:**

"The coastal protection strategy in India is synonymous with a prime objective to protect the land; the concept of protecting the beach and the environment are relatively new concepts; coastal protection is not perceived within the wider context of the economic development of the coastline. The most frequently applied methods for coastal protection have been through the use of hard structures such as seawalls or groynes. Despite many failures and environmental damage seawalls and groynes have continued to be constructed which in many cases has simply shifted the problem to neighboring coastal areas or left the real problem to be solved by future generations. As the pressure on the coastal zone due to human-induced activities as well as relative sea level rise keeps expanding, there is an urgent need to find sustainable solutions for coastal protection."

"There is a general awareness of the impacts of hard structures. Rock wall comes easily and soft solutions are largely untried and the technologies are not well understood. The continued use of hard technologies for coastal protection are being questioned by decision makers and there is now a widespread interest and realization of a need to change to softer and appropriate solutions. The move to softer solutions although an easy and acceptable solution in principle but in practice requires significant behavioral changes by all those involved. The transition from hard to soft structures will require an integrated program of awareness, training, capacity building and other support initiatives."

"Presently measures to manage coastal erosion have generally been designed as a local emergency measure rather than sustainable and economically beneficial perspective. The most frequently applied protection methods are hard structures such as seawalls or groynes. Such interventions provide only land protection, and do not address the root cause of the problem; in many cases the protection structures actually accelerate erosion resulting in major losses of the beach."

**Institutional arrangements:**

"Central Water Commission (CWC), the technical arm of MoWR is the apex agency for shoreline protection / coastal erosion works in the country. CWC implements coastal protection works through two Directorates viz. the Coastal Erosion Directorate (CED) and the Beach Erosion Directorate (BED). The activities of the two directorates are not well coordinated and lateral communication between the two peer bodies is virtually non-existent. The apparent lack of an integrated approach to coastal erosion problems stems from this structural imbalance."

**Policy:**

"A major weakness in the current sector orientated sector development is the difficulty of addressing the processes and impacts of one sector on another. A prime cause of erosion is the interaction of coastal infrastructure on the natural coastal processes. To help this horizontal coordination is proposed to establish the CWC and the State Executing Agencies (SEA) as the lead group at National and State levels to coordinate coastal infrastructure activities. At National level the leading

organization should be the CWC. The CWC remit is presently restricted to erosion control but there is a key requirement for the coastal erosion directorate to take on a wider coordination role of all coastal infrastructure works including erosion control, ports and harbors, dredging etc. At the State Level it is proposed to establish a Coastal Infrastructure Management Unit (CIMU) within the State Executing Agencies. This unit would be given a mandate to coordinate all coastal infrastructure programs.

"There is requirement for a policy document to support the process of shoreline management planning. The policy document for shoreline management planning should include:

- (i) Charging the Coastal District Authorities to prepare Shoreline Management Plans (in coordination with the State Executing Agencies and agencies) over an agreed period. The shoreline plans would be advisory and non-statutory. The plans would be participative involving the stakeholders and local level stakeholders in the primary planning, as well as lateral involvement of different government departments / sector agencies.
- (ii) Increasing the mandates of the SEA and the CWC to take on a lead coordination role in the overall coastal management specifically to coordinate and guide the development and management of all coastal infrastructure.
- (iii) Ensuring that all shoreline developments and interventions are properly studied and subject rigorous technical analysis including numerical modeling. Projects should be supported by environmental assessments."

44. In June 2009 an expert committee of the MoEF published the report "Final Frontier - Agenda to protect the ecosystem and habitat of India's coast for conservation and livelihood security." In this report the committee noted that currently, the shoreline of the country is undergoing a major change because of a large number of port and harbor projects. These projects involve large quantities of dredging, shore protection works, breakwaters, and reclamation. Experts are unanimous that each structure would impact the shoreline-particularly the beach formation. Already, many of these infrastructure projects have caused significant shoreline changes-like in Ennore, Puducherry, Alibag, Digha and Dahej. It is also observed that the shoreline is being impacted adversely by mining projects and by interventions like the building of shore-protection structures like groynes. The Committee was of the view that these developments have all led to serious threats to the coast, as especially beaches face severe erosion and shorelines are visibly changing. Given that the Central and state governments propose to construct several ports and harbours all along the shore in the coming years, these projects could have irreversible adverse impacts on the coast. The Committee recommended the following:

“The government must immediately study the cumulative impacts of the individual projects on the coastline, pending which there should be a moratorium on expansion of existing ports and initiation of new projects.”

45. Subsequently, in 2009 the MoEF assigned to the Ministry of Earth Sciences (MoES) to conduct a study for identifying the coastal stretches with regard to human-induced erosion/accretion caused by construction of shore protection measures and breakwaters of ports. Based on the discussions held with MoES, the study was initiated in

two phases namely - (a) phase-I to submit a report based on existing data/information by 15 th October, 2009; (b) phase - II of the study involves micro level analysis that would be carried out for the entire country for the purpose of examining shoreline changes due to existing projects and identify suitable sites for development.

46. In October 2009, ICMAM and INCOIS, MoES, submitted a joint report to the MoEF in which they stated that:

"Coastal structures constructed for port operations and coastal protections works interfere with the littoral transport are found the most common cause of coastal erosion."

"A groyne just shifts the erosion problem to the downstream area...: The more efficient the groyne field is in protecting the shoreline within the groyne field, the more lee side erosion will be experienced downstream."

"When a breakwater is built on the shoreline it interferes with the littoral drift budget and the results are sedimentation and shoreline impact. Like a groyne, the breakwater acts as a blockage of the littoral transport, whereby it causes trapping of sand on the upstream side in the form of an accumulating sand file, and the possible bypass causes sedimentation in the entrance. The sedimentation requires maintenance dredging and deposition of the dredged sand. The result is a deficit in the littoral drift budget which causes lee side erosion along the adjacent shoreline."

"The major interventions which lead to morphological impact are listed as:

Coastal structures of any kind, which by their occupation directly impact the transport processes and thereby the coastal morphology. Such structures are typically the Ports and marinas, active coastal protection structures (groynes, breakwaters and all other structures occupying part of the foreshore and/or the shoreface), passive coastal protection structures (revetments, seawalls etc. which fix the coastline), reclamations and dikes, inlet jetties at tidal inlets and sea works at river mouths, embankments for bridges /runways, intake / outlet structures crossing the littoral zone."

The report also stated that about 23% or as much as 1248 km of shoreline along the Indian main land is affected by various degree of erosion varying from minor, moderate to severe.

47. In May 2010, the Department of Science, Technology and Environment (DSTE) and the Puducherry Coastal Zone Management Authority (PCZMA) of the Government of Puducherry held a consultation meeting on "Restoration and Protection of Puducherry Coastline" which was attended by various Government Departments, experts from the National Institute of Ocean Technology (NIOT), Anna University, members of the Auroville Foundation and of civil society. As reported in the Minutes of the Meeting "There was a consensus among the participants on the need to protect and nourish the coast of Puducherry and the adjoining areas by adopting site specific coastal protection and restoration techniques after carrying out scientific studies and in consultation with all stakeholders including fishermen community." However, no concrete measures have been implemented to date.

48. A May 2010 document of the CWPRS states that of the various methods used for protection of the coast such as seawalls, revetments, bunds, groynes, offshore breakwaters, etc., the nourishment beach is the best method that should be used for shore protection. However, due to other considerations beach nourishment is still seldom used. Later in the same year, the Indian Journal of Geo-Marine Sciences publishes a paper on coastal erosion and mitigation methods. The author of that study concludes "The recent trends in coastal erosion mitigation is shifting towards soft, innovative, and pro-active methods, since the hard methods have their own repercussions on coastal land and beaches such as down-drift erosion, high cost, poor aesthetics etc. Hard structures such as seawalls and revetments, stop erosion of coastal lands, but refocus the erosion onto the beach. A number of soft methods are available now for erosion mitigation and are being used popularly all over the world. They are very eco-friendly, cheap and construction-friendly too. They may be necessarily adopted on a larger scale in the future erosion mitigation projects, and choice of the particular solution depending upon the local hydrodynamics and site conditions."

49. In October 2010, the PWD, GoP had commenced a Sea Wall project along the coast of Chinnakalpet Village, Puducherry without obtaining prior clearance under the Coastal Regulation Zone Notification, 1991. The site was inspected by members of the Puducherry Coastal Zone Management Authority and direction was issued on 13.10.2010 to the Chief Engineer, PWD under Section 5 of Environment Protection Act, 1986 to stop the sea wall construction immediately and submit necessary application to PCZMA for obtaining the Coastal Regulation

Zone Clearance. PWD has complied and stopped the work. No further work has taken place since then.

50. In the month of November 2010 an official of the MoEF from the Southern Regional Office at Bangalore assessed the state of the coast of Puducherry in relation to the development of fishing harbor at Murthykuppam as it was being opposed by civil society groups. In this report it was observed that "For the old fishing harbor, it was informed that even though, on some earlier occasions, some of the concerned authorities have attempted to address the problem of coastal erosion, the measures taken for the old harbour remains inadequate and not comprehensive since the attempts made were too small and were on piecemeal basis, thus the efforts are not successful in controlling the erosion problems. In the new fishing harbor also a similar situation is arising. Now it is high time for the Government of Puducherry to prepare and launch a detailed implementation plan after due consultations with experts and by integrating all the concerned departments & stake holders for properly managing the coastline and to solve the issues arising out of developments which are taking place in the coast line of Puducherry and adjoining Tamil Nadu."

51. In the month of December 2010, the Project Implementation Agency for the Emergency Tsunami Reconstruction Project (PIA, ETRP) of the GoP issued a Tender for "Maintenance Dredging Works at Ariyankuppam River and the Sea Mouth for Puducherry Fishing Harbour" as part of the reconstruction and modernization of fishing harbor at Puducherry. The related maintenance dredging operations began in 2011 and are still continuing to date. However, while the dredging contractor is required to dispose the dredged material in the

ocean, the dredged material was instead dumped on the land and within the harbor limits. The dredged sand, estimated to be amounting to about 1,50,000 cubic meters is still lying on the land instead of being returned to the littoral drift. This subtraction of coastal sediment from the sedimentary budget of the Puducherry-Tamil Nadu coastal compartment and sediment cell is resulting in erosion of the coastline. Several representations to put the sand back into the sea to nourish the beaches have been made but no action has been taken till date.

52. In January 2011 the Puducherry PWD issued an Expression of Interest (EOI) for erosion control and reclamation of Puducherry beach with "soft solutions" such as geo tubes, clearly stating that all conventional "hard" measures such as "boulders, tetrapods, etc.," were excluded from the chosen solutions, as deemed harmful for the coastal environment. Additionally, it is stated that the proposed solution should have a short-term and long term perspective plan to ensure better coastal environment. Moreover, the proposed solutions should involve the authorities of neighbouring state and stake holders. Most importantly the consultant should "ensure that there is no adverse impact to the coastline due to the implementation of the project." This point is emphasized in the EOI repeating that "there is need to ensure that this does not affect the adjoining features of the coast line both in the state of Tamil Nadu and Puducherry." Finally, during the post-construction stage, the project proponent is supposed to achieve the objectives of coastal protection and reclamation in a "holistic manner." By undertaking such a project, the Government of Puducherry should be able to address its coastal erosion problems while ensuring that the

neighbouring state and areas of Tamil Nadu not only do not get affected but also benefit from it.

53. On 18<sup>th</sup> August 2011 the Hon'ble Minister for Public Works Department, Govt. of Tamil Nadu writes to the Hon'ble Chief Minister of the Govt. of Puducherry to apprise him that the lack of sand by-passing and its effect on the littoral drift at the Ariyankuppam Harbour in Puducherry has caused severe erosion of the neighbouring Tamil Nadu coastline, as a result of which in the year 2006, 200 m of beach was eroded, several homes were destroyed and the life of a child was lost. The Hon'ble Minister draws the attention to an earlier letter from the Govt. of Tamil Nadu in which the GoP is requested not to continue construction of groynes without proper technical studies as it is likely to further affect the Tamil Nadu shoreline. He also informs that the proposed Deep Water Port would have a catastrophic effect on the shoreline of Villupuram District. He also requests the GoP to start sand by-passing and to desist going ahead with the proposed Deep-Water Port without obtaining the prior consent of the GoTN so that Tamil Nadu coastline is not further affected. On 29<sup>th</sup> November 2011, a second letter is sent to remind the GoP to start sand by-passing at the harbor and to stop further interruption of Littoral Drift that would take by construction of the proposed Deep Water Port which would further affect the Tamil Nadu coast and go against his Govt's interests.

54. On 29<sup>th</sup> Dec. 2011, the Secretary, Port Department, GoP held a stakeholder's meeting on restoration of Puducherry coastline as reported in the Minutes of the Meeting circulated on 23<sup>rd</sup> Feb 2012. During that the Secretary suggested that "all should work for a

sustainable solution to the problem of erosion." The Chief Engineer, PWD-cum Director of Ports-responded that "the PWD was called by the MoEF and had suggested that Geotubes be put up along the Puducherry coast towards restoring the coastline." During the meeting "all agreed that the rejuvenation of the lost beaches is of vital importance since it would not only help the fishermen but also facilitate tourism." To conclude, the Secretary assured that "a long term sustainable solution to the restoration of the coastline of Puducherry [was] for the benefit of one and all."

55. On 2<sup>nd</sup> February 2012 the Government of Puducherry constituted the Evaluation Committee for Assessing the consultant for the coastal protection work in Puducherry using Geotextile tubes. This committee is yet to meet.

56. In March 2012 the MoEF wrote to the Government of Tamil Nadu to enquire about the construction of groynes along the Chinnamudalyar Chavadi Kuppam coast based on a complaint against the proposed groynes that was made by the NGO Pondy CAN. No action was taken.

57. In its September 2012 report, the National Institute of Ocean Technology (NIOT) stated the following with regard to the groynes constructed in Puducherry and Tamil Nadu: "It is recognised that groynes should be used only to maintain existing conditions, rather than enhancing beach volume or eliminating erosion... But this should be used only after exhausting all other available options for restoration." The report also stated:

"There is a need for a well-defined plan that seeks to treat the shoreline and the issue of erosion in a more integrated, sustainable and strategic manner."

"It is recommended to have a total and common shoreline management plan for the entire Puducherry and the adjacent Tamil Nadu coast so that short-term and long-term strategies can be drawn considering the coast in total. The short-term strategies required at specific sites can be designed and integrated in long-term strategies, if a shoreline management plan is prepared."

"As Puducherry is known for its tourism/recreation, it is advisable to restore the natural beach by implementing beach nourishment... The above option will not only help in gaining a natural beach but also help in controlling the erosion of the northern coast. The detailed design of beach nourishment scheme can be worked out based on discussions. Also, eco-friendly techniques and "soft engineering measures" to stabilize the coast could be implemented along with beach nourishment for retaining the sand and to restore the ecological functions and services that are provided by sandy beach ecosystems as well as enhance livelihood opportunities for the fishing communities and increase value to the coast." "A long term and permanent solution can be found if both the Tamil Nadu and Puducherry Governments jointly work towards a common, long-term and sustainable shore restoration strategy. Short-term solutions may need to be implemented, but these have to take into account the long-term solutions and should be "no-regret" solutions." "The general principle of "working with nature" would be a better

approach for cost-effective and sustainable coastal protection measures. Puducherry needs to consider modern protection practices which achieve a more effective and sustainable means of coastal protection while also addressing local amenity and economic development aspects. It is most important to ensure that the natural movement and flow of sediment along the shoreline is maintained."

"The beach restoration will primarily benefit the coastal dwellers living along the Puducherry and nearby Tamil Nadu coast including fishing households, the owners, operators and employees of fishing boats, hotels and other tourism related businesses and their employees. But mostly it will benefit all the residents of this peaceful coastline whose young children have never even seen its beautiful beaches."

58. The report "The Challenged Coast of India" published in October 2012 also points out with regard to the performance of the groynes that were built along the Soudanikuppam-Thandiriayankuppam coast that for every square meter of beach that has been artificially gained with the use of groynes, about 4 square meters of beach space is damaged and lost on the down drift side of the groynes. Therefore, it is unequivocally demonstrated that groynes are causing more damage to the coast and that they are exacerbating the problem of erosion.

59. Neither the Government of Puducherry, nor the Government of Tamil Nadu examined any available options for beach restoration. Mechanical sand bypass was not implemented. More importantly, there is no record that the Government of Puducherry ever considered the simplest, most effective way to restore the beaches, end the massive

erosion of village land into the sea, restore the livelihoods of the local fishing communities, and reverse the trend of increasing saline infiltration into the local aquifers: to remove the damaging harbour at Ariyankuppam and allow the natural flow of sand to resume. When one compares the insignificant economic benefit conferred by the harbour with the enormous economic, social, and environmental cost of the ravaged coastline for 18 kilometres to the north (and moving ever-northward as hard structures proliferate), it is astonishing that the Government of Puducherry never considered this obvious alternative.

60. A comprehensive plan for coastal protection has not yet been considered in spite of the fact that both the Governments of Puducherry and Tamil Nadu are fully aware that the erosion is spreading northwards. Instead of taking proactive measures to mitigate the erosion, the erosion is instead allowed to go on, increase and further degrade the coastal environment. Both the governments jump into action only when it is too late and the erosion of the coast has become a manmade disaster in which the homes and livelihoods of the coastal communities have been destroyed. It is only in such belated circumstances that the concerned Government authorities resort to the construction of seawalls as emergency measures. Under these disastrous circumstances, the concerned authorities justify the construction of seawalls as their only option available. Such tardy actions, ad hoc-ism and poor planning and negligence only results in the destruction of a greater extent of the coastal environment.

61. The destruction of sandy beaches represents a very significant economic loss to Puducherry's tourism industry and to the traditional

fishing industry all along the damaged coast. It is estimated that thousands of traditional fishermen have been unable to pursue their livelihoods since the beaches were lost and seawalls have come up; and thousands more are now forced to launch their boats from places outside their own villages. An estimated 300 acres of land mass has been taken by the sea, including numerous houses and other buildings in coastal villages. The governments of Puducherry and Tamil Nadu have spent hundreds of crores of rupees dumping boulders to create riprap seawalls and groynes. In addition to the environmental and aesthetic loss to the immediate coastline, this construction activity entails collateral environmental damage to the mountains from which the boulders are quarried and the energy used to transport them from mountain to seaside. The hard structures on the coastline have radically transformed the morphology and morphodynamics of the coast and intertidal marine zone. This has far-reaching consequences for the entire ecosystem.

62. The endangered Olive Ridley sea turtles which are listed under Schedule I of the Indian Wildlife Protection Act (1972) nest along the Puducherry-Tamil Nadu coastline. Olive Ridleys are known to return to their natal beaches to lay their eggs. But when man-made structures have been built in the place of their nesting beaches, as is the case in Puducherry and Tamil Nadu, these structures prevent sea turtles from continuing their innate life cycles. Coastal structures therefore directly threaten and further endanger sea turtles by reducing suitable nesting habitat and displacing turtles into less-than-optimal nesting areas. The destruction of the natural beach space and habitat by human induced erosion followed by the armouring of the coast with seawalls

and groynes makes it impossible for sea turtles to make their nests on the beaches. The ad hoc and unscientific construction of seawalls and groynes along the coast is therefore directly endangering the existence of sea turtles.

63. The armouring of the coast with seawalls and groynes also results in the destruction of intertidal habitat that is required by marine flora and fauna such as planktons, crustaceans, bi-valves, mollusks, other invertebrates and even fishes. These flora and fauna also form part of the marine food chain which supports fish stocks. The destruction of inter-tidal habitat therefore impacts large numbers of marine species and ecosystems.

64. Without the beach providing the crucial sandy buffer between the sea and the land, erosion of the seabed at the coastal margin has resulted in salt water infiltration into the local aquifers. The Central Ground Water Board has reported that the ground water development in the Puducherry region is rather very high and no further groundwater development is to be encouraged. On the other hand, there is an urgent need for regulation of over-exploitation, protection and augmentation of ground water resources to recharge the depleted aquifer systems. An assessment of the vulnerability of seawater intrusion in Puducherry coastal region is indicating that both the northern and southern coasts of the Puducherry region are vulnerable to seawater intrusion. As the groundwater resources of the Puducherry region are already stressed, the increase of seawater intrusion due to human induced coastal erosion has to be avoided at all costs.

65. The increased salinity in Puducherry's fresh water has resulted in hundreds of hectares of farm land becoming fallow. In addition to ruining the taste of the local drinking water, increased salinity is well-known to cause kidney disease. Several of the shallow wells along the coast on which the local communities depend for their freshwater requirements have already turned saline. The loss of freshwater resources is causing severe hardship to the local communities as they have to find alternative sources of freshwater.

66. It is also important to note that at the national level the coastline also represent the boundary of the nation and its territories. The indiscriminate, uncontrolled, and unnatural alteration of the coastline is resulting in the uncontrolled alteration of the national boundary, both on land as well as offshore, of the international maritime border and that of the Exclusive Economic Zone (EEZ). This is something that has political and economic implications which are of national concern.

67. The seawalls and groynes are being built without any carrying capacity studies. The coastal environment of the Puducherry-Tamil Nadu region is already heavily and to a large extent impacted by the ongoing human induced erosion of the coast caused by the Puducherry harbor. Further armouring of the coast with seawalls and groynes will only result in reducing the carrying capacity of the coastal environment beyond the point of self-sustainability.

68. The coastal environment is a highly dynamic and therefore complex environment to manage. Experience has shown that the less one interferes with coastal processes, the lower is the likelihood of having coastal management problems. Across the world, increasingly

the scientific community is of the opinion that particularly on the coast it is preferable to "work with Nature" rather to try to "fight against Nature." This approach is also akin to the approach of the Precautionary Principle which advocates that if the coastline is eroding, particularly due to human induced causes, it is preferable to address the root causes of the problem and try to return to the original, natural, stable state of the coastline, rather than to attempt to re-engineer the coastal environment which results in perpetual alteration of the coastal environment with all its accompanying negative impacts.

69. Despite the recognition by the Union and State Governments, as well as that of related Government agencies such as the CWPRS and the NIOT, private and professional consultancy firms, local communities, civil society groups that "soft" engineering measures such as beach nourishment, which are environmentally and socially friendly and increasingly adopted world-wide, should be adopted tackle coastal erosion, especially to mitigate and reverse human induced coastal erosion, there is however a lack of well-defined scientific and technically sound processes and systems for sand nourishment of eroding beaches which the Government and their respective agencies can follow or implement. As a result of the lack of such well-defined processes and systems, Governments and their agencies fall back upon past experience, even though it is obsolete and go about "business as usual." In this regard, it is also important to note that the "business as usual" favours vested interests, such as the consultants who get to design more and more coastal structures as they cause more and more erosion, the quarry owners, the transporters and the contractors who keep on benefitting

as long as coastal structures need to be built even though it is at the cost of the coastal environment.

70. Seeing the unwillingness of concerned agencies to restore and nourish the beaches, very often the local communities that have at first lost their livelihoods when their beaches have eroded, eventually get desperate when nothing is done to control the erosion particularly when they start losing their habitations. As a last and desperate measure to save their homes, these communities start to demand that their homes be immediately protected in whichever way possible, even with the use of hard structures such as seawalls and even if it is at the cost of the coastal environment. The measures, particularly those that are environmentally destructive, that are demanded in a state of desperation by the local communities and followed out of popular demand are not necessarily the best for their livelihoods, the environment, the society at large and the future generations, especially in the long term.

71. Since the construction of the harbor, seawalls and groynes commenced in Puducherry and Tamil Nadu, numerous civic groups, including Coastal Action Network, have complained to the Government of Puducherry and Government of Tamil Nadu and warned of the worsening environmental and economic disaster. Both governments have ignored these warnings and continued to build hard structures, in the Cuddalore, Puducherry and Villupuram Districts, disrupting the natural flow of coastal sediment, damaging their own coast and their neighbor's, in complete disregard of the economic, social, and environmental consequences of this construction.

72. The Government of Tamil Nadu currently proposes to build a series of 12 more groynes from Chinnamudalaiyar Chavadi to Bommiyarpalayam, as well as additional seawalls and groynes to the south of Puducherry, as far south as Cuddalore. Some of the work has already commenced. The Government of Tamil Nadu has not sought or been given prior permission and approval by the Ministry of Environment and Forests, Government of India to construct these groynes.

73. On or about 18 November 2012, the Government of Tamil Nadu began dumping rocks on the coast at Chinnamudalaiyar Chavadi, thereby commencing construction of a planned 180m groyne. This activity will cause further damage to the coastline, and to the lives and livelihoods of those who live along the coastline, if it is allowed to proceed. The Government has, without considering the hazards of undertaking such activity has commenced and is continuing with the construction of the groyne, the fact that the detriment caused to the coastal environment is not limited only to that particular sector has not, even been considered. No proper environmental impact assessment has been done by the concerned authorities, in violation of governing laws and violating rights guaranteed under Article 21 of the Indian Constitution. The economic consequences of the damage caused by the construction of the groyne will be disastrous.

74. On 27<sup>th</sup> December 2012 the Puducherry Coastal Zone Management Authority (PCZMA) wrote to the MoEF requesting it to impress upon the Government of Tamil Nadu to refrain from undertaking ad hoc coastal protection measures such as seawalls and groynes without consulting and taking the consent of the Government

of Puducherry and required CRZ clearances. The PCZMA also expressed its apprehension that the proposed and on-going coastal protection measures erected in adjacent Tamil Nadu would cause erosion of the Puducherry coastline. Moreover, the PCZMA also expressed the need to follow the recommendations of the stated NIOT report which suggests that a common shoreline management plan for the entire Puducherry and adjacent Tamil Nadu coastline should be prepared so that short-term and long-term strategies can be drawn considering the coast in total.

75. According to the CRZ Notification 2011, Section 3, (iv), activities that disturb the natural course of seawater such as for erosion control are prohibited if constructed without an Environmental Impact Assessment study. Section 4.2, (i), (c) of the same notification also states that the procedure for clearance of such activities should be undertaken after comprehensive EIA with cumulative studies for projects in the stretches classified as low and medium eroding by MoEF based on scientific studies and in consultation with the State Governments and Union territory Administration. The seawalls and groynes being built by the GoTN at Chinnamudalaiyar Chavadi Kuppam and in Villupuram District and Devanampattinam in Cuddalore District are being undertaken without an EIA, neither with a comprehensive EIS with cumulative studies and without consultation with the State Governments and Union territory Administration and are therefore in violation of CRZ Notification 2011.

76. According to the Environmental Impact Assessment Notification 2006, the construction of seawalls and groynes being built by the GoTN at Chinnamudalaiyar Chavadi Kuppam and in Villupuram District and Devanampattinam in Cuddalore District are classified as "Category A"

projects as they fall within 10 km of the inter-state boundary and would therefore require an EIA. The natural flow of sediment and beach sand along the coast is an essential phenomenon and process which supports natural habitats, flora and fauna, human populations and their fundamental right to life and livelihood. Coastal sediment is a public good that forms the very foundation of the sandy coastal environment, without which none of the sandy coastal environments can be sustained. The human induced loss of sediment from the coast and the resulting erosion and destruction of coastal habitats therefore directly results in the violation of the fundamental right to life and livelihood of all that which is dependent on coastal sediment. Just as water, food, air, light, etc., are an essential part of the life and livelihood of every citizen of this country, similarly coastal sediment is equally an essential public good which is a part of the life and livelihood of all that which depends on the coastal environment. The human induced loss of coastal sediment within and even across state boundaries therefore results in the violation of the fundamental right to life and livelihood of all that which depends on the coastal environment. Numerous representations on the above issues described above, particularly such as the human induced coastal erosion, mitigation and restoration through sand nourishment, restoration of the sandy beach ecosystems and the livelihoods of the local communities, etc., spanning a period of more than a decade have been made by several citizen and civil society groups. However, not only is the human induced erosion of the coast increasing unabated, but it is even being aggravated by adhoc, unscientific and unsustainable coastal management measures which are arbitrary and illegal. The Respondents have not undertaken any scientific studies with regard to the exacerbation of erosion due to the

groynes already constructed, and erosion is rapidly progressing with no intervention to prevent the same on the part of the statutory authorities.

77. On 29<sup>th</sup> Sep 2012, a representation was submitted to the District Collector, Cuddalore, the 2<sup>nd</sup> applicant submitted representation to several authorities including the respondents herein. On 06<sup>th</sup> Jan 2012, a representation was submitted to the Government of Tamil Nadu, requesting them to refrain from construction of groynes. On 20<sup>th</sup> Nov 2012 and 12<sup>th</sup> Dec 2012, further representations were made by the applicants to the authorities, requesting them to take appropriate action. However, no reply has been received from the authorities and the damage caused to the environment due to the indiscriminate construction of hard structures along the coast continues to this day.

**Stand of Puducherry Coastal Zone Management Authority (PCZMA) and MoEF&CC**

78. Replies have been filed by contesting respondents. It is not necessary to refer to all the replies. It will suffice to refer to the affidavit filed by Puducherry Coastal Zone Management Authority (PCZMA) on 06.10.2021 and the reply filed by the MoEF&CC. PCZMA refers to comprehensive Shoreline Management Plan (SMP) for Puducherry in May, 2015 by the National Institute of Ocean Technology (NIOT), Ministry of Earth Sciences, after monitoring the coastal processes responsible for the shoreline changes from 2012. The SMP was submitted to the MoEF&CC. NIOT designed a hybrid solution for the first time in the country with two reefs and sand nourishment for restoring the eroding beach along Puducherry town. The proposed hybrid solution involved the following:-

- i. Construction of one Nearshore Wedge Reef opposite to the Chief Secretariat on the north end of Puducherry town foreshore, with the crest at Chart Datum.
  - ii. Construction of one Offshore Reef placed at the south end, at 300 m north of the pier, with the crest at 1 m above Chart Datum.
  - iii. Sand nourishment using 4,50,000 m<sup>3</sup> of sand between northern and southern reef along the Coastline of Pondichery Town and Gandhi Statue
79. The above project has been adopted in Puducherry for which CRZ Clearance has been granted.
80. The executive summary in the report of the NIOT is as follows:-

*“Many beaches along East coast of India are subjected to erosion, which threatens habitat, property, public infrastructure, and the tourist industry. Loss of sand can be attributed natural changes (sea level rise, storms, and more recently persistent low pressures due to climate change) and man-made activities (harbors, jetties, seawalls, groins, dredging of tidal inlets and damming of rivers). Pondicherry coast is not exceptional and after construction of Pondicherry harbour, coast north of harbour is subjected to sea erosion. Initially, sand bypassing was carried out by harbour authorities to prevent down drift erosion and to maintain channel free from siltation. Later, discontinuing of sand bypassing due to various technical reasons, lead to erosion on Pondicherry city. UT Pondicherry and Tamil Nadu State Government resorted to short term measures to protect the coast from erosion. Seawall of length 6 Km was constructed by UT Pondicherry, which covers city of Pondicherry and the coastal stretch (2 km) from Sodhanaikuppam to Thanthriyankuppam was protected groin field combined with seawall by Tamil Nadu government. The erosion problem shifted further north, Chinnamudalaiyar Chavadi is experiencing increased erosion and many buildings were lost to sea. Highly eroding fishing hamlet, north of Chinnamudalaiyar Chavadi, and Chinnakalapettai village in UT Pondicherry were also protected by seawall. As on date, 8 km length of the coast was protected by seawall and groin field along Pondicherry coast by UT Pondicherry and Tamil Nadu Government. The above solutions could protect the coast under threat but the authorities and stake holders need an integrated long-term solution for protection of coast and restoration of natural beach.*

*Since, the available information on Pondicherry coast is not sufficient for working out suitable strategies; NIOT was consulted by both UT Pondicherry and Tamil Nadu government to work out long*

*term/ short term strategies for management of coast from erosion and impact of cyclones. NIOI has initiated studies to evolve strategies for protection of Pondicherry coast under the project "Demonstration of Shore Protection Measures through Pilot project", with financial support from Ministry of Earth Sciences. NIOI has taken p task of developing strategies for protection of Pondicherry coast with objectives: 1) Assessment of status of existing protection measures and its performance 2) To Understanding the processes responsible for shoreline changes through monitoring waves, tides, currents, sediment characteristics and coastal morphology 3) Analysis of long/short term trends of shoreline along Pondicherry coast and 4) Development of shore protection measures through numerical models. The first three activities were completed and documented in the present report. The final report with strategies for protection of coast will be arrived at based on the discussion with the governments of Tamil Nadu and UT Pondicherry and stake holders.*

*The study aims at understanding various dynamical aspects of coast (water level variations, currents & circulation, tides, waves, bathymetric variations, sediment transport, shoreline changes etc.) to develop hind cast, now cast and forecast models on shoreline changes in priority areas for identification of vulnerable areas of erosion/ accretion to arrive at remedial measures for protection of coastline from natural and human perturbations. The strategy proposed in the present study aims at obtaining a comprehensive picture on shoreline changes along Pondicherry coast and to take remedial measures for shoreline management along the stretch.*

*The study area with coastline length of 18 km was divided into four distinct zones, namely 1) Pondicherry harbour and adjoining areas, 2 km 2) Pondicherry city, protected by seawall, 6 km 3) Groin field, 2 km and 4) Open coast, 8 km. The shoreline changes in these four zones were analyzed using remote sensing data and field measurements. The result indicate that the average rate of erosion and accretion is 4m/yr and 5m/yr respectively and the coast needs immediate attention for its protection from natural causes or man-made activities. The estimated rate of net drift would be in the order of 0.28 -0.30 million cum, which needs to be confirmed by detailed shoreline monitoring.*

*Coastal processes responsible for shoreline changes were monitored during 2012, where data on winds, waves, tides, currents, sediments, bathymetry etc. were collected between Pondicherry Port and Kalapettai village, covering a coastline of 18 km. Seasonal variations on water levels, wave climate, currents and circulation sediment transport, shoreline changes etc. were studied. The measurements made indicated that the tide propagates from south to north. Currents measured upto a depth of 20 m were found to be seasonal, northerly during SW monsoon and southerly during NE monsoon. The average currents during SW and NE monsoon would be 0.3m/s and 0.5m/s. The near shore currents generated by waves follow pattern of coastal Currents In Tamil Nadu coast, which is added*

advantage in developing shore protection measures. Wave climate indicate that 70% of the waves approach the coast from SE direction and the remaining 30% from NE direction.

Pondicherry, known for tourism/recreation, has lost its natural beach due to construction of seawall. **It is advisable to restore natural beach by implementing beach nourishment. Initial estimates indicate that sand to extent of 3.0 million cum need to be placed north of harbour for length of 600 m near the Gandhi statue. The above option not only helps in gaining natural beach but also helps in controlling the erosion of northern coast. The detailed design of beach nourishment scheme can be worked based on the discussions. Also, eco-friendly techniques and "soft engineering measures" could be implemented along with beach nourishment for retaining of sand and also to restore ecological functions of the coast.**

Short-term solutions may need to be implemented, but these solutions have to take into account the long-term solutions and should be "no-regret" solutions.

A long-term and permanent solution can be found if both the Tamil Nadu and Pondicherry governments jointly work towards a common, long-term and sustainable shore restoration strategy.”

81. Summary and recommendations in the report are as follows:-

#### **“Summary and Recommendations**

The coast along Pondicherry and the adjacent areas of the Villupuram district has been experiencing severe erosion for the past 20 years. Natural causes interception of littoral drift by the harbour at Ariyankuppam village, Pondicherry constructed in 1990 and the subsequent construction of coastal defence structures such as seawalls and groins caused erosion in this and groins regions. Pondicherry and Tamil Nadu governments made several attempts to protect the coast under threat using options like seawalls and groins. Though these protection measures have offered some relief to the coast under threat, adjacent parts of coast areas are eroding, more unstable and are constantly under threat.

**There is a need for a well-defined plan that seeks to treat the shoreline and the issue of erosion in a more integrated, sustainable and strategic manner. This can be achieved by a Shoreline Management Plan (SMP), which considers the issues at a reasonable scale and focuses on restoring the natural sandy beaches. Policy makers, engineers and stakeholders seek a long term solution to restore the sandy beaches of this entire affected region. The basic questions which need to be answered and understood before attempting any such coastal restoration scheme are following:**

- 1. Present status of coast (geomorphic setting and functional performance of already implemented protection measures)**
- 2. Coastal processes along this coast in relation to proposed coastal restoration schemes.**
- 3. Priorities of policy makers and stakeholders**
- 4. Requirements of stakeholders**
- 5. Economical, environmental and social sustainability of proposed restoration measures.**

**Considering the above, the overall objective of the coastal restoration project should be to address the coastal restoration needs through the implementation of economically viable restoration works using environmental and socially appropriate solutions. This report describes the present status of the coast and the performance of existing coastal protection schemes. The data on sea bathymetry, land topography, hydrodynamics (tides, waves, currents and sediment characteristics) and shoreline changes was collected for analyzing the coastal processes. A joint meeting with Tamil Nadu and Pondicherry governments is required to draw strategies for coastal restoration measures where various technical alternatives can be analysed in relation to the priorities of the government keeping in view that the solution adopted should be sustainable, long term and permanent without affecting the coastline located further north.**

**The analysis of long-term shoreline change data indicate that the average rate of Shoreline recession and progression over a period of 30 years is in order of 4 m/yr and 5 7yr respectively. However, localized shoreline change rates. recession specifically, of 50 1n in a season were observed. However, the rate of shoreline change and/or erosion is dependent on gradient of sediment transport along the coast, which is dependent on Configuration of the coast, near shore current and availability of the sediments.**

**The 18 km length of coastline of Pondicherry was divided into four zones for analysis. The first zone (Zone A) covering a length of 3.5 km represents the zone of direct influence of the Pondichery harbour. The sand has accumulated up to the tip of the south breakwater with maximum accretion of 180 m and the sediment started bypassing to the north. The northern side of the harbour is protected by a seawall and sediment deposition is noticed, during the NE monsoon due to the southerly drift. The maximum erosion is about 40 m at distance of 600 m from north breakwater from 1991 to 2000. The second zone (Zone B- 4 km), which is part of Pondicherry township is protected by a seawall. Securing at the foot of the seawall is noticed during active monsoon. The third zone (Zone C- 2.5 km) is protected by a series of disjointed groins. These groins were constructed during 2005-2007 and. accretion to an extent of 90 m is noticed at northern longest groin located at Thathiriyankuppam. The accretion at all groin compartments indicate availability of sediments along the Pondicherry coast during both monsoons.**

***The CWPRS (1978) has reported that the net drift was estimated to be about 500,000 cu.m. at the time of design of Pondicherry Harbour but the present estimated rate of net drift by us would be in the order of 2,00,000 - 2,80,000 cu m, which needs to be confirmed by detailed shoreline monitoring. The coast north of longest groin at Chinnamudalaiyar Chavadi village has experienced increased erosion and shoreline recession during 2008 to an extent of 70 m. South of this coast regained some lost material during 2012 due to southerly drift and bypassing of sediments from the groin with a net accretion of 20 m. The Zone D with a length of 8 km is not protected by major scheme and maximum erosion observed 1991-2010 is around 25m. A sea wall of length 165 m was constructed at village Chinnakalapettai to protect the coast from erosion.***

***The following are major observations for arriving at coastal restoration strategies for both the Pondicherry and adjacent Tamil Nadu coast.***

- Pondicherry has been known as a beautiful beach town. The beaches here, particularly along the famous beach road were used for all kinds of activities by a large cross-section of people. Children chased crabs and looked for interesting shells. The famous Masi Magam festival of Pondicherry relied on the big beach where the chariots of all the gods from all the temples near and far would come. With the beach almost gone and the rocky sea wall, all these little everyday pleasures of each and every resident of Pondicherry and all those who throng to its shores, have been snatched away.***
- The basic objective of shore restoration projects moderate the long-term average erosion rate and shoreline change from man-made causes, which can be achieved only if the natural dynamics of the coast is well understood.***
- The medium term analysis of shoreline change data from 1991 -2012, indicate that this region needs immediate attention.***
- Protection schemes till date have been implemented in isolation both in Pondicherry and Tamil Nadu, a common phenomenon even in developed countries. This has happened because of various constraints like scientific/engineering understanding of nature, economics of the scheme to be implemented, institutional issues, lack of interstate coordination and acceptance by stakeholders. It is recommended that short-term and long-term strategies can be drawn. considering the coast in total by Pondicherry and Tamil Nadu Government. The short-term strategies required at specific sites can be designed and***

*integrated in long-term strategies, if a shoreline management plan is prepared.*

- *Pondicherry harbour is causing a deficit in sediment supply to the northern coast. Sand bypassing carried out by harbour authorities for certain period could maintain the beach north of the harbour. Later, discontinuing the sand bypassing resulted in loss of beaches in the northern coast. The recent analysis of satellite data suggests that parts of the littoral sediments are bypassed naturally to northern coast. While designing the shore restoration scheme for Pondicherry coast, the configuration of harbour and its relation to natural bypassing of sand at harbour should be studied.*
- *Pondicherry wave climate is influenced by both the SE and NE waves With occasional cyclonic storms crossing the coast. The maximum surge level observed above tide is 0.7m with a tidal range of 1.2 m. The waves approaches from SE direction from April September with mean direction 135 deg, while during NE monsoon. the direction is 90 deg. The coastal currents are seasonal, directed to north during SW monsoon and south during NE monsoon. The average currents during SW and NE monsoon would be 0.3m/s and 0.5 m/s. The near shore currents generated by waves follow similar pattern like coastal currents in Tamil Nadu coast, which is an added advantage in developing Common shore restoration measures. A detailed study conducted at Vellar estuary and Ennore shows shoreline change governed by wave climate and tidal influence is insignificant. Low pressure systems like events of 2007 can cause significant damage to coast and some of its changes could be permanent. The coastal protection scheme seawall built along the Pondicherry town for length of 6 km need to be assed carefully to avoid further damage during cyclone or low pressure periods.*
- *Pondicherry is known for its tourism/recreation, it is advisable to restore the natural beach by implementing beach nourishment. At Ennore, sand dredged from harbour to an extent of 3.5 million cum was placed. on, north of harbour to prevent down drift erosion. The performance of beach nourishment was assessed based on long-term data at Ennore which shows nourishment has supplied sand to northern coast for period of 5 years and coastline was stable even after the construction of harbour. Initial estimates indicate that sand to the extent: of 3.0 million cum needs to be placed north of the harbor for length of 600m near the Gandhi statue. The above option will not only help in gaining a natural beach but also help in controlling the erosion of the northern coast. The detailed design of beach nourishment scheme can be worked out based on discussions. Also, eco-friendly techniques and "soft*

***engineering measures" to stabilize the coast could be implemented along with beach nourishment for retaining the sand and to restore the ecological functions and services that are provided by sandy beach ecosystems as well as enhance livelihood opportunities for the fishing communities and increase value to the coast.***

- ***A long term and permanent solution can be found if both the Tamil Nadu and Pondicherry Governments jointly work towards a common; long-term and sustainable shore restoration strategy.***
- ***Short-term solutions may need to be implemented, but these have to take into account the long-term solutions and should be "no-regret" solutions.***
- ***Worldwide there is now increasing examples of replacement of hard structures like seawalls with softer options Such as beach nouishment, Sand bypassing, dune planting and offshore submerged reefs. Thus, the general principle of "working with nature" Would be a better approach for cost-effective and sustainable coastal protection measures. Pondicherry needs to consider modern protection practices which achieve more effective and sustainable means of coastal protection while also addressing local amenity and economic development aspects. It is most important to ensure that the natural movement and flow of sediment along the shoreline is maintained.***
- ***All Shore protection schemes should be monitored scientifically under technical guidance of expert institutes by Tamil Nadu and Pondicherry governments for improvement in its performance. The crest of berm data collected by Tamil Nadu PWD do not cover any location along Pondicherry coast. The closest locations considered for analyzing the data along this coast are Devanampattinam and Oyyalikuppam at south and north of Pondicherry respectively.***
- ***Given the social and economical importance of the Pondicherry beaches, the coastal restoration option should consider the protection of land, buildings, groundwater, ecology, livelihoods and public and private infrastructure against future loss and damage caused by erosion and storms.***
- ***The beach restoration will primarily benefit the coastal dwellers living along the Pondicherry and nearby Tamil Nadu coast including fishing households, the owners, operators and employees of fishing boats, hotels and other tourism related businesses and their employees. But mostly it will benefit all the residents of this peaceful coastline whose young children have never even seen its beautiful beaches. No One expected that waves due to monsoon or cyclone take away the natural beach."***

## **Reply of MoEF&CC**

82. Reply of the MoEF&CC dated 02.02.2021 deals with the status of updation/revision of CZMPs as follows:-

*“2. That in exercise of the powers conferred by the sub-section (1) and Clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 read with clause (d) of the sub-rule 5 of the Environment (Protection) Rules, 1986, Ministry of Environment and Forest had notified the Coastal Regulation Zone Notification, 1991 on 19<sup>th</sup> February, 1991, which, inter-alia, provided classification of Coastal Regulation Zone (hereinafter referred to as CRZ) areas and norms for regulating developmental activities therein. This Notification was subsequently amended from time to time.*

*3. That it is submitted that in supersession of the **CRZ Notification, 1991, the Coastal Regulation Zone Notification, 2011 was notified on 6 January, 2011 for regulation of developmental activities along the coastal stretches and to ensure the livelihood security to the fisher communities and other local communities, living in the coastal areas, to conserve and protect coastal stretches.***

*4. The validity of the Coastal Zone Management Plans (hereinafter referred to as CZMPs) approved under CRZ Notification, 1991 was extended from time to time, the last such extension being upto 31.07.2018, pending preparation and subsequent approval of fresh CZMPs under the CRZ Notification, 2011. All the developmental activities in the CRZ areas of coastal States were required to be regulated as per the above mentioned notifications and within the framework of approved CZMPs.*

*5. It is humbly submitted that the CZMPs of all coastal States except State of Goa has been approved under the provisions of the CRZ Notification, 2011.*

*6. That it is submitted that in supersession of the CRZ Notification, 2011, the Coastal Regulation Zone Notification, 2019 was notified on 18<sup>th</sup> January, 2019 for regulation of developmental activities along the coastal stretches and to ensure the livelihood security to the fisher communities and other local communities, living in the coastal areas, to conserve and protect coastal stretches, specifically focused on conservation and management plans of Ecologically Sensitive Areas (ESAs) which did not feature in the CRZ Notification, 2011.*

*7. It is humbly submitted that the High Tide Line (HTL) has been mapped out and standardized for the entire coast of the country unlike the HTL earlier allowed to be demarcated by one of the seven authorized agencies, that too only for identified stretches/sites, and*

*thereby bringing in standardization and authenticity and removing arbitrariness.*

*8. It is submitted that the Hazard Line for the entire coast of the country has also been mapped and is required to be incorporated in CZMPs of the coastal States or Union territories.*

*9. It is humbly submitted that the CRZ Notification, 2019 shall, however, come in force only after the respective CZMP framed to the CRZ Notification, 2011 have been revised/updated by the States/UTs, as per the provisions of the new CRZ Notification and approved by the Ministry of Environment, Forest & Climate Change. Para 6 (i) of CRZ Notification, 2019 inter alia states as under:*

*"All coastal States and Union territory administrations shall revise or update their respective coastal zone management plan (CZMP) framed under CRZ Notification, 2011 number S.O 19(E), dated 6th January, 2011, as per provisions of this notification and submit to the Ministry of Environment, Forest and Climate Change for approval at the earliest and all the project activities attracting the provisions of this notification shall be required to be appraised as per the updated CZMP under this notification and until and unless the CZMPs is so revised or updated, provisions of this notification shall not apply and the CZMP as per provisions of CRZ Notification, 2011 shall continue to be followed for appraisal and CRZ clearance to such projects."*

*Before finalizing the CZMP concerned State/ Union Territories/ Coastal Zone Management Authorities are required to adopt due procedure in preparation of CZMPs as stipulated in Para 6 (ii) of CRZ Notification, 2019 which includes public consultation. Para 6 (iii) of said notification inter alia states as under:*

*"The coastal States and Union territories shall prepare draft CZMP in 1:25,000 scale map identifying and classifying the CRZ areas within the respective territories in accordance with the guidelines given in Annexure-IV to this notification, which involve public consultation."*

*A true copy of CRZ Notification, 2019 is annexed herewith and marked as ANNEXURE-R/1.*

*10. It is humbly submitted that the National Centre for Sustainable Coastal Management (hereinafter referred to as NCSCM) made a presentation on the status of the updation/revision of CZMPs prepared based on provisions of CRZ Notification, 2019, in the 40 meeting of National Coastal Zone Management Authority (NCZMA) held on 28.08.2020, as under:*

<b>S.No.</b>	<b>State/UT</b>	<b>Status of Approved CZMP2011</b>	<b>Status of Draft CZMP 2019</b>	<b>Agency preparing CZMP-2019</b>	<b>Time Required to Complete</b>
1.	Maharashtra	Approved	COMPLETED <u>Public hearing completed</u> in all districts other than Palghar and Sindhudurg districts	NCSCM	COMPLETED
2.	Odisha	Approved	COMPLETED <u>Public hearing completed</u>	ORSAC/SAC	COMPLETED
3.	Andhra Pradesh	Approved	80% work Completed including Buffering of CRZ boundaries	NCSCM	4 MONTHS-DEC 2020
4.	Karnataka	Approved	50% work Completed including Buffering of CRZ boundaries	NCSCM	4 MONTHS-DEC 2020
5.	Puducherry	Approved	30% work Completed including Buffering of CRZ boundaries	NCSCM	3 MONTHS-NOV 2020
6.	Daman&Diu	Approved	50% work Completed including Buffering of CRZ boundaries	NCSCM	3 MONTHS-NOV 2020
7.	Tamil Nadu	Approved	20% work completed	NCSCM	5 MONTHS-JAN 2021
8.	Gujarat	Approved	20% work completed	NCSCM	6 MONTHS-FEB 2021
9.	Kerala	Approved	In progress Being monitored by Kerala High Court	NCSCM	Status to be obtained from NCESS
10.	West Bengal	Approved	Pending. Status not known	IESWM	Status to be obtained from IESWM
11.	Goa	Draft published in website for public hearing. Revision based on amendments, in	Pending	Not Known	Amendments to CRZ Notification 2011 notified on 1 <sup>st</sup> May 2020

		<i>progress (NCSCM)</i>			
12.	<i>Andaman &amp; Nicobar Islands</i>	<i>ICRZ plans:9 Islands IIM Plans:5 Islands Approved</i>	<i>ICRZ Plans of Great Nicobar &amp; Little Andaman Islands completed and submitted to ANZMA for public hearing</i>	<i>NCSCM</i>	<i>6 MONTHS-FEB 2021</i>
13.	<i>Lakshadweep Islands</i>	<i>Approved</i>	<i>Revision of IIMPs of Suheli, Kadamat &amp; Minicoy Islands in progress</i>	<i>NCSCM</i>	<i>6 MONTHS-FEB 2021</i>

*11. It is humbly submitted that the answering Ministry is yet to receive the draft CZMPs updated/ revised as per the provisions of the CRZ Notification, 2019 from all the coastal State Governments for further consideration and approval.*

*12. It is further humbly submitted that the CRZ Regulations are to be implemented and monitored including violations thereof by the concerned State Coastal Zone Management Authority in accordance with the proved CZMPs of the respective region of the coastal state.”*

### **Consideration of the Issue, finding and Directions**

83. We have given due consideration to the issue of protection of the beaches from human induced erosion caused by hard structures. It is a fact that these hard structures may prevent erosion at the said stretch temporarily but the adverse impact of such measures are felt upstream or downstream where erosion starts. Thereby such hard measures only transfer the problem of shoreline change until and unless a holistic study is undertaken keeping in view that sediment cells and appropriate scientific measures taking into consideration both soft and hard. The problem exhaustively highlighted by the applicant, noted above raises substantial question of environment. We are satisfied that the same needs to be addressed by all coastal States/UTs for protection of beaches from human induced erosion caused by hard structures. We find that

Puducherry model of SMP based on report of NIOT submitted in March 2015 addresses the issue comprehensively and can be adopted subject to any suitable change based on further study in terms of the recommendations in the said report. As suggested in the report, there is need to replace hard structures like seawalls, Groynes etc. with softer options such as beach nourishment, sand bypassing, dune planting, offshore submerged reefs, etc. Thus, the general principle of “working with nature” would be a better approach for cost-effective and sustainable coastal protection measures. There is no objection to the said model by any of the appearing parties. Further, the Tribunal also notes that depiction of high, Medium and low erosion stretches along the coast line is mandatory in the CZMPs. The CRZ Notification, 2019 regulates foreshore developmental activities based on these parameters as well. Like ports and harbours are prohibited in high erosion stretches. We also note that inspite of the CRZ Notification being issued in Jan, 2019, the CZMPs have not been finalized and approved for 11 State/UT. This is gross violation of Hon’ble Supreme Court judgment in *Indian Council For Enviro Legal ... vs Union of India & Ors.*, (1996) 5 SSC 281. Accordingly, we direct Chief Secretaries of the Coastal State/UT to finalise the CZMP and get them approved by MoEF within 2 months. The approved CZMP shall contain the parameters as listed in the CRZ 2019 Notification including High, Medium and Low erosion stretches for such erosion prone areas. SMP shall be prepared as illustrated by NIOT for such erosion prone areas. We further direct preparation/updation of their SMPs for such identified eroding stretches shown in the CZMPs within six months. Pending preparation/updation of such SMPs by the Coastal States/UTs, no further hard structures for erosion control be raised or constructed.

The application is disposed of.

A copy of this order be forwarded to all the Coastal States/UTs and MoEF&CC for compliance by e-mail.

**Appeal No. 18/2017 (SZ)**

84. As noted earlier challenge in the appeal is to the proposed construction of series of 19 Groynes from Ennore to Ernavoorkuppam in Madhavaram Tuluk of Tiruvallur District, Tamil Nadu by the Public Works Department (WRD). The main ground challenge of the CRZ Clearance is that construction of groynes in coastal area has adverse impact by obstructing littoral drift. The impugned clearance ignores this aspect. The impugned CRZ clearance itself mentions that the same is subject to further orders in O.A. 04/2013 which was pending on the date when CRZ Clearance was granted.

85. While dealing with the O.A. No. 4/2013 (SZ), we have approved the report of the NIOT recommending preparation of SMP which should be environmentally compatible, in the manner suggested and discussed above. We have also directed all the Coastal States/UTs in the Country to prepare their respective SMPs accordingly. The impugned CRZ Clearance is not sustainable in view of above discussion. The same is accordingly set aside without prejudice to fresh clearance being granted in accordance with the approved SMP.

The appeal is allowed in above terms.

Adarsh Kumar Goel, CP

K. Ramakrishnan, JM

Sudhir Agarwal, JM

Pushpa Sathyanarayana, JM

Dr. Satyagopal Korlapati, EM

Prof. A. Senthil Vel, EM

April 11, 2022  
O.A. No. 04/2013(SZ)  
With Appeal No.18/2017(SZ)  
A