

## **MINUTES OF THE 4<sup>th</sup> CPDAC MEETING HELD AT ALIBAG (MAHARASHTRA) ON 4<sup>TH</sup> APRIL, 2000.**

The 4<sup>th</sup> Meeting of the "Coastal Protection and Development Advisory Committee" (CPDAC) was held at Alibag; Raigad district in Maharashtra on 4-4-2000, under the Chairmanship of Shri S.C. Chitkara, Member (River Management), CWC, and ex-officio Additional Secretary, Govt. of India.

As part of the 4<sup>th</sup> CPDAC meeting, all the participants visited Theronda village in Taluka Alibag, Distt. Raigad, situated about 13 km from Alibag in the forenoon to see severe sea-erosion taking place in the area during monsoon season as well as due to tidal effect. During the site visit, it was observed that a vast portion of land had been eroded due to severe wave action during the last monsoon. Number of village representatives were also present during the visit who had expressed apprehensions that if no immediate action is taken before this monsoon, their land and other properties may vanish and some day the village may vanish altogether. All the Committee members were of the view that immediate emergency measures may be taken up by the Govt. of Maharashtra in consultation with CW&PRS, Pune, to arrest further erosion. Thereafter detailed studies may be carried out by the Govt. of Maharashtra/CW&PRS, Pune, for proper planning and execution of suitable coastal protection works in this area.

After return from site visit, CPDAC agenda was taken up for discussion. List of participants of 4<sup>th</sup> CPDAC Meeting is given at Annex-I.

At the onset, Chairman, CPDAC, and Member (River Management), CWC, Shri S.C. Chitkara, and Shri N. Rama Rao, CEO, Maharashtra Maritime Board, Mumbai, welcomed the participants at the 4<sup>th</sup> CPDAC meeting. Thereafter; a brief presentation was made by Mr. Sathe, Dy. Secretary, PWD, Maharashtra, on coastal region of Maharashtra, especially Konkan coast.

### **4.1 CONFIRMATION OF THE MINUTES OF THE 3<sup>RD</sup> MEETING**

Minutes of the 3<sup>rd</sup> meeting of CPDAC held on 10-11<sup>th</sup> September, 1998, at Panjim, Goa, were confirmed in view of the follow-up actions taken by the CPDAC Secretariat.

### **4.2 TO SORT OUT INCONSISTENCIES IN COASTAL LENGTHS FROM VARIOUS SOURCES.**

Chairman observed that there is a marked difference in the length of coast indicated by the Chief Hydrographer, Govt. of India, and the respective States in respect of Gujarat, Maharashtra, Goa, Tamil Nadu and Karnataka, and he suggested that concerned States should reconcile this issue with Chief Hydrographer before any decision is taken by CPDAC.

In this connection, members indicated that first the criterion for working out coastal lengths should be finalised by CPDAC. On this, Commander, S.K. Jha, Hydrographer, Maharashtra Maritime Board indicated that all the relevant parameters have already been finalized by the Chief Hydrographer and those can be obtained instead of adopting any new criterion. It was finally decided that the maritime States would approach Chief Hydrographer, Govt. of India, to reconcile the difference in the length of coast as given by the Chief Hydrographer and the respective States. CPDAC

Secretariate would also approach Chief Hydrographer to get finalised parameters for working out length of the coast.

Members suggested to co-opt Chief Hydrographer, Govt. of India, as one of the members which was agreed to by the Chairman. CPDAC Secretariate is to take up the matter with the Ministry of Water Resources.

**( Action: Maritime States/CWC)**

#### **4.3 TO ORGANISE A COORDINATED PROGRAMME OF COLLECTION, COMPILATION, EVALUATION AND PUBLICATION OF DATA RELATING TO VARIOUS NATURAL PHENOMENON AND COASTAL PROCESSES WHICH AFFECT THE COASTLINE.**

Member from Govt. of Orissa stated that Chief Engineer & Basin Manager, Lower Mahanadi basin would act as their nodal officer and formal Govt. order in this respect will be issued by the Govt. of Orissa.

Member from Tamil Nadu informed that instead of a single nodal officer, a proposal to set up a core group consisting of Commissioner/Director, Deptt. of Town and Country Planning as its Chairman and Director, IHH, Poondi, Director, Institute of Ocean management, Anna University, Chennai, Prof. & Head, Ocean Engg. Centre, IIT, Chennai & Director, Deptt. of Environment as its members has been sent to their Govt. for approval.

For the State of Andhra Pradesh, Deputy Chief Engineer-IV, I&CAD Deptt, Govt. of Andhra Pradesh has been nominated as their nodal officer. Member from West Bengal informed that Chief Engineer-II, I&WD, Govt. of West Bengal will act as their nodal officer, and formal orders will be issued shortly.

Chairman requested member from Kerala to nominate their nodal officer and also requested all the members from States to collect all the coastal data, as per list already circulated earlier, from various agencies and send the same to CW&PRS, Pune, for creation of National Coastal Data Bank at Pune.

**(Action: All Maritime States)**

#### **4.4 TO ORGANISE GENERAL INVESTIGATION, STUDIES AND RESEARCH WITH THE HELP OF CENTRAL AND STATE ENGINEERING RESEARCH INSTITUTIONS.**

##### **4.4.1 INVESTIGATION FOR MUD BANK ALONG KERALA COAST.**

Member from Kerala intimated that CESS, Thiruvananthapuram, have taken up this study on their own, therefore, this item may be dropped. Chairman requested all the members to formulate research proposals in the fields related to coastal studies and send them directly to INCH Secretariate now with Director, Foundation Engineering and Special Analysis Directorate, CWC, Room No. 716(S), Sewa Bhavan, R.K. Puram, New Delhi-110066, under intimation to CPDAC Secretariate.

**(Action: All Maritime States)**

##### **4.4.2 SATELLITE IMAGERIES TO MONITOR SHORE LINE CHANGES.**

Shri A.S. Rajawat, Principal Investigator, Coastal Processes Project, Space Application Centre (SAC), Ahmedabad, informed all the members that satellite to be launched is Carto-sat and not Asia-sat. The resolution of Carto-sat will be 2.5 m and not 1.0 m as thought of for Asia-sat. He informed that shoreline changes can also be

monitored from the available IRS Satellite data and imageries. Member from West Bengal also informed that monitoring of shoreline changes was possible in West Bengal even with available satellite data.

Members were of the view that resolution of 1 m is not required to monitor shore line changes. In view of the discussions held, Chairman requested all the Member-States not to wait for Carto-sat data with 2.5 m resolution, but go ahead with their studies to monitor shoreline changes using available IRS data, and for this purpose assistance from SAC, Ahmedabad, or other State/central agency engaged in remote sensing may be availed by the States.

**(Action:All Maritime States)**

#### **4.4.3 COASTAL ATLAS**

Shri A.S. Rajawat, SAC, Ahmedabad, representing Dr. Shailesh Nayak, Scientist (SG), SAC, Ahmedabad, and Convenor of the sub-committee, intimated that National Coastal Land use maps/Atlas has been brought out by them which contains most of the contents of the proposed Coastal Atlas. Either this can be digitized, reduced to A3 size and some additional information added to it or altogether a new Coastal Atlas can be brought out.

Member from NIO, Mumbai, suggested definitions of coastline, high tide line (HTL), low tide line (LTL), etc., as finalized by the Ministry of Environment & Forests should be used while making Coastal Atlas. Members were of the view that sub-committee should interact with MOEF also while deciding about contents and other details of Coastal Atlas.

After deliberations, members were of the view that sub-committee should discuss and bring a proposal about budgeted estimate, prioritization of work, time frame for preparation of Coastal Atlas in 1:25,000 scale in A3 size, etc., for discussion in the next meeting of CPDAC.

**(Action : SAC, Ahmedabad/CWC)**

#### **4.4.4 STRENGTHENING THE FACILITIES FOR COASTAL ENGINEERING RESEARCH BY THE STATES.**

Initiating discussion on this issue, Chairman informed the members that more and more use of mathematical modelling studies of coastal processes, coastal protection works, etc., may be carried out as it is cheaper; number of alternatives can be studied in no time and also it does not require much infrastructural facilities.

Chief Engineer, C&SR, CWC, Coimbatore, informed the members that about 16 mathematical models related to coastal studies are available in the market and it may take about 6 to 8 months to set up, calibrate and study of large number of alternatives. He has been requested to send the details of these models to CPDAC Secretariate to be circulated among members for information.

Shri A.G. Kale, Jt. Director, CW&PRS, Pune, informed members that although mathematical modelling has number of advantages but physical modelling is also important and both are complimentary to each other. He also informed that in case of coastal protection works, physical modelling has an edge over mathematical modelling.

Dr. J. Dattatri again stressed the need of close interaction of Govt. Deptt. engaged in coastal protection works with the academic Institutions. Chairman, CPDAC, requested members to have more interaction with academic institutions and send

research proposals involving these institutions for consideration and funding from INCH, INCOH, etc., which may also include proposal for strengthening of the facilities of coastal unit of Engineering Research Stations, if required.

**(Action: C.E.(C&SR),CWC/Maritime States)**

#### **4.5 TO LAY DOWN PRINCIPLES IN CONSTRUCTION TECHNIQUES OF COASTAL PROTECTION MEASURES FOR THE GUIDANCE OF STATE AUTHORITIES.**

Member from Kerala intimated that they had constructed 4 experimental sea walls, 250 m each with conventional design, conventional design with coir mat filter, alternative design with coir mat filter and conventional design with high density monofilament woven plastic cloth. It has been observed by them that coirmat is not at all good as filter material as it decay very fast leading to failure of structure. Sea wall in reach IV, i.e., conventional design with high density monofilament woven plastic cloth is cheapest of the four designs and is working satisfactorily. Member from Kerala informed CPDAC that they would like to study performance of this design for some more time before arriving at some conclusion.

Chairman requested member from Kerala to send a detailed note alongwith performance of experimental sea works for the benefit of other members.

**(Action : Kerala Govt.)**

#### **4.6 TO REVIEW THE PERFORMANCE OF THE WORKS CARRIED OUT BY THE STATES AND EVOLVE IMPROVED DESIGN TECHNIQUES BASED ON SUCH EXPERIENCE FROM TIME TO TIME.**

##### **4.6.1 MODIFICATION IN THE DESIGN OF SEA WALL.**

Member from Kerala intimated CPDAC that one experimental sea wall design with monofilament woven filter has been completed and its performance has been satisfactory for the last two monsoon seasons. They would like to monitor performance of this design for some more time. The construction of sea walls of alternative design is under progress.

Chairman requested Member from Kerala to complete the second work at the earliest, monitor the performance of both the works, and send a detailed note on both the design as well as performance of these designs to CPDAC Secretariate for circulation among members.

Member from West Bengal informed CPDAC that they have taken some protection works at Digha which is not as per conventional design, and it is performing well. Member from West Bengal was requested to send a detailed note to CPDAC Secretariate for circulation among other members and for discussion during the next CPDAC meeting.

Dr. J. Dattatri made a brief presentation about new coastal protection works completed in Karnataka consisting of PVC coated gabion technology from Meccafferri, Italy. He informed that this technology is a little costlier than conventional design, but is very effective and works completed are performing very well. Members were informed that CPDAC Secretariate had arranged a short presentation on use of PVC coated gabions for erosion control by representative of Meccafferri, but they could not make presentation due to some unavoidable circumstances. Members interested in getting more details on this may contact Shri B.B. Karajagi at the following address :

Sh. B.B.Karajagi  
Chief Engineer (Retd), CWC,  
Flat No.2, 133/27  
Nihar Apartment  
Prabha Housing Society  
Kothrud, Pune-411029  
Ph : (020)-5434646

Director, CW&PRS, Pune, informed that they are carrying out some basic studies with the use of flexible nylon gabion and results are encouraging. They have been requested to send a note to CPDAC Secretariate on use of flexible nylon gabions for protection works for circulation among members.

**(Action:Kerala, West Bengal, CW&PRS,Pune)**

#### **4.6.2 PREPARATION OF INDIAN SHORE PROTECTION MANUAL**

In view of the revision of Shore Protection Manual now renamed as Coastal Engineering Manual (CEM) by the Coastal & Hydraulics Laboratory (CHL) of US Army Corps of Engineers, it was decided after deliberations to wait for the release of CEM sometime in 2000. Further, decision on preparation of Indian Shore Protection Manual, its contents and agency for preparation of this Manual will be taken after release of CEM, and discussions in the next meeting of CPDAC.

#### **4.7 NATIONAL COASTAL PROTECTION PROJECT (NCP) FOR SEEKING EXTERNAL ASSISTANCE.**

Chairman informed all the members about the urgency in early finalization of consolidated NCP by CWC for getting TAC/Investment clearance before posing it for external funding due to constant pressures from Ministry of Water Resources and some of the States. He requested all the Members from States to expedite submission of their NCP proposal by 20<sup>th</sup> April, 2000, or so. All the member States agreed to submit their NCP by stipulated date or by end of April, 2000.

During discussion some of the members raised some doubt about B.C. Ratio calculations and they were of the view that as in the case of drought schemes, B.C. criteria of 1 should also be relaxed for anti-sea erosion schemes as number of social benefits arising out of these schemes could not be quantified and as such in many cases schemes may not be economically viable based on B.C. Ratio criteria of 1. Chairman suggested all the members that they should try to quantify number of social benefits arising out of these schemes as well and assured members to take up issue with the Planning Commission through CPDAC Secretariate for review of B.C. Ratio criteria.

**(Action: All Maritime States/CWC)**

#### **4.8 TO INTERACT WITH THE INTERNATIONAL AGENCIES ENGAGED IN THE WORK OF COASTAL PROTECTION AND TECHNOLOGY TRANSFER IN THE FIELD OF COASTAL PROTECTION.**

##### **4.8.1 TRAINING.**

Dr. J.Dattatri informed all the members that specific training course was arranged by the Karnataka Engineering College which was highly successful.. Shri Kale, Jt. Director, CW&PRS, intimated that they can arrange 2 to 3 courses per year at CW&PRS, Pune, if specific request come from the States.

Chairman requested all the member States to arrange regional training courses for their engineers on coastal processes, protection measures, etc., either through CW&PRS, Pune, or through some academic institutions or through any other central/state agencies.

**(Action - All Maritime States)**

#### **4.9 NEW ACTIVITIES ASSIGNED TO THE COASTAL PROTECTION AND DEVELOPMENT ADVISORY COMMITTEE (CPDAC).**

During discussion, members were of the view that preparation of master plan should be based on holistic approach for sustainable development of coastal region and this will involve number of agencies from multiple disciplines.

It was decided that members will send their suggestions about contents of Integrated Master Plan for Sustainable Development of Coastal Zone. Chairman also suggested CPDAC Secretariate to interact with MOEF for finalization of contents of this master plan and to know about any action already taken by them in this regard.

**(Action: All Members/CWC)**

#### **4.10 COMPOSITION OF COASTAL PROTECTION AND DEVELOPMENT ADVISORY COMMITTEE (CPDAC).**

On the issue of nomination of Dr. Shailesh Nayak, Scientist (SG) & Head, Marine & Water Resources Division, SAC, Ahmedabad, as a non-official member, Members were of the view that non-official member should be a renowned expert in the field of coastal engineering and since Dr. Shailesh Nayak is an official working with SAC, he cannot be nominated as non-official member. However, all members were of the view that he can be co-opted by CPDAC as official member in his capacity as Head, Marine & Water Resources Division, SAC, Ahmedabad. Member from Gujarat handed over letter from Director, SAC, Ahmedabad, conveying his approval for nominating Dr. Shailesh Nayak as an expert in CPDAC. Chairman suggested CPAC Secretariate to take up this issue with the Ministry of Water Resources.

On the issue of nomination of Shri G.N. Kapadi as other non-official member, all the members were of the view that a panel of non-official experts, who can be selected as non-official members, should be created in CPDAC Secretariat from which 3 non-official members can be nominated. Chairman requested all the members to send names of experts along with their bio-data for creation of a panel for nominating non-official members.

**(Action: All Members/CWC)**

#### **4.11 STATUS OF COASTAL PROTECTION WORKS IN MARITIME STATES.**

Members from States were of the view that the list of contents for status report is very exhaustive and it may take more time for preparation of such status reports. On this Director, Coastal Erosion Dte., CWC, informed members that some of the contents are common with NCPP. Chairman requested all the Members from States to prepare status reports for their States and submit same to CPDAC Secretariate at the earliest.

**(Action: All Maritime States)**

#### **4.12 SCOPE FOR MANGROVE PLANTATION**

Member from West Bengal informed that mangrove plantation has given good results in their State also. Member from Orissa intimated that in addition to mangroves, plantation of other trees like Jamun, cashewnut, etc., also provide defence against coastal erosion as they help in reduction of wind velocity.

Shri Kale, Jt. Director, CW&PRS, informed that no doubt mangrove plantation is helpful in controlling erosion, but it can act as only second line of defence. He also informed that mangrove plantation require systematic treatment otherwise these plantations may not be successful. Chairman requested him to send more information on mangrove plantation for the benefit of other members.

Dr. Dattatri informed that Dr. Anand Rao, Indian Institute of Science, Bangalore, and Member, Karnataka State Committee for Science and Technology is a renowned expert on mangrove, and he can also be contacted for more information on this issue.

**(Action : CWPRS, PUNE)**

#### **4.13 BEROSIN TECHNOLOGY FOR COASTAL PROTECTION**

Sh. A.G. Kale, Jt. Director, CW&PRS, Pune, informed the members that based on information available with them, Berosin technology may not be suitable for our seas and may be difficult to implement. Chairman suggested to send a copy of brochure already circulated in the 3<sup>rd</sup> meeting or any other information available in CPDAC Secretariate to all members for their information, and this item may be dropped for the time being.

**(Action : CWC)**

#### **4.14 CREATION OF SEPARATE COASTAL ENGINEERING DIVISION**

Director, CW&PRS, elaborated the necessity of having separate coastal engineering unit in all the maritime States for better management of coastal zone. All the members supported this view, but informed that there are number of practical difficulties in implementing this as Govt. may not approve creation of new department with new posts, but they were of the view that new unit could be created by redeployment of existing staff if Govt. agrees to this idea.

Members suggested that Chairman, CPDAC, may take up this issue with Chief Secretary of all the maritime States. Chairman agreed to this suggestion and also suggested CPDAC Secretariate to send data collection guidelines and format once again to all the members from States to ensure collection of data and its submission to CW&PRS as per these guidelines.

**(Action : CWC)**

#### **4.15 GABION PROPOSED BY M/S. MCCAFERRI IN RIVER TRAINING AND WATER RESOURCES STRUCTURE.**

Director(CED), CWC, informed all the members that presentation on use of PVC coated gabion for erosion control works could not be arranged by Sh. B.B. Karajagi, representative of Meccafferi, Italy, due to some unavoidable circumstances this time. Efforts would again be made by CPDAC Secretariate to arrange this demonstration in the next meeting of CPDAC.

**(Action : CWC)**

#### **4.16 ANY OTHER ITEM WITH THE PERMISSION OF CHAIR**

##### **4.16.1 VENUE OF THE NEXT MEETING**

Chairman requested members from States to volunteer for next meeting of CPDAC. Member from West Bengal very kindly volunteered to host next meeting of CPDAC in West Bengal subject to approval of Govt. of West Bengal, and he has also agreed to communicate confirmation to CPDAC Secretariate after getting Govt. approval.

In the end, Chairman, CPDAC, and other members thanked Shri N. Ramarao, CEO, Maharashtra Maritime Board, Mumbai, and his team for hosting the 4<sup>th</sup> CPDAC meeting at Alibag and making excellent arrangements by them. Chairman, CPDAC, also thanked all the participants for their valuable contributions in making this meeting successful.

The meeting ended with a vote of thanks to the Chair.



**No.4(5)/2000-CED/  
Government of India  
Central Water Commission  
Coastal Erosion Directorate**

806(N), Sewa Bhavan, R.K. Puram,  
New Delhi - 110066.

Dated the 28<sup>th</sup> April, 2000.

**Sub : 4<sup>th</sup> Meeting of Coastal Protection & Development Advisory Committee  
(CPDAC) - Forwarding of Minutes - reg.**

I am directed to enclose a copy of Minutes of the 4<sup>th</sup> Meeting of Coastal Protection And Development Advisory Committee (CPDAC) held on 4<sup>th</sup> April, 2000 at Alibag, Maharashtra. Your comments, if any, may kindly be communicated at the earliest. It is also requested to take follow-up action on the items concerning your State/Department, and send a report in this regard to this office at the earliest.

If no comments are received from your side by 30-5-2000, the minutes of the 4<sup>th</sup> CPDAC Meeting will be assumed as confirmed.

**Encls :** As above

( H.K. VARMA )  
Director  
Tel.No.619551  
Fax No.6102267  
6195290

**To**

**MEMBERS OF CPDAC :**

1. Member(RM),CWC, & Ex-officio Addl.Secretary to Govt. of India and Chairman, CPDAC, 2<sup>nd</sup> Floor, Sewa Bhavan, R.K. Puram, New Delhi-66.
2. Chief Engineer (P&D), CWC, and Member-Secretary (CPDAC), 815(N), Sewa Bhavan, R.K. Puram, New Delhi-110 066.
3. Adviser (I&CAD), Planning Commission, Yojna Bhawan, Sansad Marg, New Delhi-110 001.
4. Advisor/Joint Secretary, (Impact Assessment), Ministry of Environment & Forests, 6<sup>th</sup> Floor, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110 003.
5. Development Advisor (Ports), Ministry of Surface Transport, 537, Transport Bhawan, Ministry of Surface Transport, 1, Parliament Street, New Delhi-11.
6. The Deputy Director General, GSI, OME&MG Wing, Ratnakar Bulding, 4-Chowrangi Lane, Calcutta-700 016 (West Bengal)
7. Commissioner (ER), Ministry of Water Resources, CGO Complex, 11<sup>th</sup> Block, 8<sup>th</sup> Floor, CGO Complex, Lodhi Road, New Delhi-110 003.
8. Chief Engineer (C&SR), CWC, No.10, R.K. Nagar, Singanakkur Post, Coimbatore-641 005 (Tamil Nadu).
9. The Director, CW&PRS, P.O. Khadakwasla, Pune-411 024 (Maharashtra).
10. The Director, National Institute of Oceanography, Dauna-Paula, Panaji, Goa-403 001

11. Dr. A. Venkataraman, IAS (Retd), (Member Agriculture), State Planning Commission, Govt. of Tamil Nadu, Ezhilagam, Chepauk, Chennai-600 005 (Tamil Nadu).
12. The Secretary, Narmada, Water Resources & Water Supply Department, Govt. of Gujarat, Block No.9, Sardar Bhawan, Sachdivalaya, Gandhinagar-382 010 (Gujarat).
13. The Secretary, Irrigation & Waterways Deptt, Govt. of West Bengal, Jalsampad Bhawan, Salt Lake, Calcutta-700 091 (West Bengal).
14. The Engineer-in-Chief (Irrigation), Govt. of Andhra Pradesh, Errum Manzil, Hyderabad-500 004 (A.P.)
15. The Commissioner, Water Transport, Maharashtra State, Indian Mercantile Chambers, 3<sup>rd</sup> Floor, Ballard Estate, 14, Ramji Bhai Kamani Marg, Mumbai-400 038 (Maharashtra).
16. The Engineer-in-Chief (Water Resources), Secha Sadan, Govt. of Orissa, Bhubaneswar-751 001 (Orissa).
17. Dr. J. Dattatri, Professor (Retd), No.283, 4<sup>th</sup> "B" Cross, 9<sup>th</sup> Main, RPC Layout, Vijaya Nagar-II Stage, Bangallore-560 040 (Karnataka).
18. The Chief Engineer (Irrigation), 2<sup>nd</sup> Floor, Junta House, Annexe, Panaji-403 001 (Goa).
19. The Chief Engineer, Minor Irrigation (South Zone), Govt. of Karnataka, Post Box No.5040, K.R. Circle, Bangallore-560 001 (Karnataka).
20. The Chief Engineer, Irr & Admn, Govt. of Kerala, Thiruvananthapuram-695 033 (Kerala).

## **OTHER PARTICIPANTS**

1. Sh. C.Ray, Chief Engineer-II, Irr & Waterways Deptt., Jalsampad Bhawan, Salt Lake, Calcutta-700 091 (West Bengal).
2. Sh. B.C. Nayak, Chief Engineer & Basin Manager, Rusikulya, Vamsadhara & Nagvalli Basin, Behrampore (Orissa).
3. Sh. A.G. Kale, Jt. Director, CW&PRS, P.O. Khadakwasla, Pune-411 024 (Maharashtra).
4. Sh.S.P. Kulkarni, Research Officer, CW&PRS, P.O. Khadakwasla, Pune-411 024 (Maharashtra).
5. Cdr. S.K. Jha, Chief Hydrographer & Chief Ports Officer, Maharashtra Maritime Board, Indian Mercantile Chambers, 3<sup>rd</sup> Floor, Ballard Estate, 14, Ramji Bhai Kamani Marg, Mumbai-400 038 (Maharashtra).
6. Sh. D.V. Sathe, Dy. Secretary (PWD), Govt. of Maharashtra, Mantralaya, Mumbai.
7. Sh. S.P. Hartalkar, Coastal Engineer, Maharashtra Maritime Board, Indian Mercantile Chambers, 3<sup>rd</sup> Floor, Ballard Estate, 14, Ramji Bhai Kamani Marg, Mumbai-400 038 (Maharashtra).
8. Sh.P.V. Gholap, Executive Engineer, Harbour Engg. Division (N), Konkan Bhawan, Navi Mumbai (Maharashtra).
9. Sh. A.S. Rajawat, Scientist SE, MWRD/RESA, Space Application Centre (ISR), Ahmedabad-380 053 (Gujarat).
10. Shri R. Radhakrishnan, SE, PWD, Director, Instt. Of Hydraulics & Hydrology, Poondi, Chennai (Tamil Nadu).
11. Sh.S.T. Nadkarni, SE, Circle-I, Irrigation Deptt., Junta House Annexe, Panaji, Goa.
12. Sh. Pramod B. Badani, Executive Engineer, Circle-I, Junta House, Irr. Deptt, Panaji (Goa).

13. Sh. T. Sukumar, SE, Minor Irrigation, Govt. of Karnataka, Post Box No.5040, K.R. Circle, Bangalore-560 001 (Karnataka).
14. Ms. A.Komalavalli Amma, SE, Irr South Circle, Thiruvananthapuram (Kerala).
15. Sh. V.S. Sreekantan Nair, Executive Engineer, Irrigation Division, Alapuzha (Kerala).
16. Sh. I.A. Gheri, Executive Engineer, Central Designs Organisation, Gandhinagar (Gujarat).
17. Sh. K. Satheesan, Dy. Director, Beach Erosion Dte., CWC, 39/800, Chittoor Road, Cochin-682 016 (Kerala).
18. Dr. Mahesh D. Zingde, NIO, Mumbai.

**PARTICIPANTS OF 4<sup>TH</sup> CPDAC MEETING**

Sl.No.	Name & Designation	Telephone No. (O)	(R)	Fax No.
1.	Sh. C.Ray, Chief Engineer-II, Irr & Waterways Deptt., Jalsampad Bhavan, Salt Lake, Calcutta-700 091 (West Bengal)	321-5327	334-7772	-
2.	Sh. B.C. Nayak, Chief Engineer & Basin Manager, Rusikulya, Vamsadhara & Nagvalli Basin, Behrampore (Orissa)	0674-400833	-	-
3.	Sh. A.G. Kale, Jt. Director, CW&PRS, P.O. Khadakwasla, Pune-411 024 (Maharashtra).	4392511	-	4392004
4.	Sh.S.P. Kulkarni, Research Officer, CW&PRS, P.O. Khadakwasla, Pune-411 024 (Maharashtra).	020-4392511	-	4392004
5.	Cdr. S.K. Jha, Chief Hydrographer & Chief Ports Officer, Maharashtra Maritime Board, Indian Mercantile Chambers, 3 <sup>rd</sup> Floor, Ballard Estate, 14, Ramji Bhai Kamani Marg, Mumbai-400 038 (Maharashtra).	022-2619752	-	022-2614331
6.	Sh. D.V. Sathe, Dy. Secretary (PWD), Govt. of Maharashtra, Mantralaya, Mumbai.	2023001	-	2023141
7.	Sh. S.P. Hartalkar, Coastal Engineer, Maharashtra Maritime Board, Indian Mercantile Chambers, 3 <sup>rd</sup> Floor, Ballard Estate, 14, Ramji Bhai Kamani Marg, Mumbai-400 038 (Maharashtra).	3739072	-	-
8.	Sh.P.V. Gholap, Executive Engineer, Harbour Engg., Division (N), Konkan Bhawan, Navi Mumbai (Maharashtra).	7571534	7579894	-
9.	Sh. A.S. Rajawat, Scientist SE, MWRD/RESA, Space Application Centre (ISR), Ahmedabad-380 053 (Gujarat).	079-6774141	02717-39620	079-6760426

10.	Shri R. Radhakrishnan, SE, PWD, Director, Instt. Of Hydraulics & Hydrology, Poondi, Chennai (Tamil Nadu).	044-5503361	-	-
11.	Sh. S.T. Nadkarni, SE, Circle- I, Irrigation Deptt., Junta House Annexe, Panaji, Goa.	226042	225911	223506
12.	Sh. Pramod B. Badani, Executive Engineer, Circle-I, Junta House, Irr. Deptt, Panaji (Goa).	374245	-	-
13.	Sh. T. Sukumar, SE, Minor Irrigation, Govt. of Karnataka, Post Box No.5040, K.R. Circle, Bangalore-560 001 (Karnataka).	0821-506457	0821- 568909	-
14.	Ms. A. Komalavalli Amma, SE, Irr South Circle, Thiruvananthapuram (Kerala).	0471-302737	0471- 436232	0471- 322927
15.	Sh. V.S. Sreekantan Nair, Executive Engineer, Irrigation Division, Alapuzha (Kerala).	0477-245312	0477- 263991	-
16.	Sh. I.A. Gheri, Executive Engineer, Central Designs Organisation, Gandhinagar (Gujarat).	20608	-	20775
17.	Sh. K. Satheesan, Dy. Director, Beach Erosion Dte., CWC, 39/800, Chittoor Road, Cochin-682 016 (Kerala).	0484-367366	-	4028916
18.	Dr. Mahesh D. Zingde, NIO, Mumbai.	64335549 6363773	6367648	-