



## Integrated Coastal Zone Management Plan (ICZMP) of Lakshadweep Islands

ICZM is a continuous and dynamic process by which decisions are made for the sustainable use, development and protection of coastal and marine areas and resources. This is carried out by harmonious decisions of all sectors and levels of government in consistent with the national policies. In other words, ICZM is a unitary programme – it has to manage development as well as conserve natural resources, while addressing the concerns of all relevant sections of the society and economy.

The coastal areas and small islands are always exposed to ecological, economic and natural hazard vulnerabilities. The concept of Integrated Coastal Zone Management Plan (ICZMP) is to facilitate the sustainable development and management of the limited resources of eleven inhabited islands of Lakshadweep, including Bangaram.



*Acropora, the commonly occurring coral species in the Lakshadweep islands*

The relative isolation, small size, narrow range of natural resources and susceptibility to natural hazards were some of the major developmental constraints and driving forces for developing ICZM in the Lakshadweep islands.

### An approach for the Development of ICZMP

In order to prepare the ICZM plan, the spatial and temporal data on the various physico-environmental features were generated. Integrated planning for the island areas including landuse, resources and pollution management is needed to resolve competition and conflict that occur frequently among the various end users. Certain sectorally oriented applications might co-exist in a multiple use approach while others might have to be severely restricted. ICZM's role is to sort out the uses and recommend the optimal mix. To carry out the ICZM approach, the detailed landuse mapping on cadastral scale, which was hitherto not available was prepared for all the inhabited islands.

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### Lakshadweep Administrator visits CESS



*Shri. B. V. Selvaraj LAS, Administrator, Union Territory of Lakshadweep (centre) having discussion with Dr. M. Baba, Director, CESS during his visit to the Centre. Dr. M. S. Syed Ismail Koya, Director, S&T Department, UT Lakshadweep is also seen (left) (Report on page 4)*

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### CESS observes World Environment Day

## Biodiversity conservation and responsible Eco-tourism for Pathiramanal

A multidisciplinary research programme on Pathiramanal, an island in the Vembanad lake, falling within the administrative boundaries of Muhamma Grama Panchayat, has been completed by CESS with the financial assistance of the Kerala State Council for Science Technology and Environment (KSCSTE).

Subsequently, the Centre has prepared an action plan with the cooperation of the Grama Panchayat, to protect the biodiversity and to promote responsible eco-tourism in Pathiramanal. This tiny island with an area of just 24 ha, is a haven for hundreds of rare migratory birds. The island is home for 88 species of birds, 160 species of plants, 23 varieties of spiders and 34 types of butterflies besides supporting 58 types of fishes in the surrounding water.

This joint project envisaged scientific conservation and restoration of the flora and fauna with peoples' participation to make the island a sought-after tourist destination. Environmental management plan and computerized information system have been developed for the island. Peripheral intervention of regeneration and conservation of mangroves and other plant species is another

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*Dr. Thomas Isaac, Kerala Finance Minister inaugurates the Pathiramanal seminar at Muhamma on June 5, 2007*

## From the Director's Desk



The Environment Day was observed all over the world on June 5<sup>th</sup>. This year's focal theme was 'planet earth'. CESS with its goal of 'protecting our earth, our future' has been in the forefront, propagating the message of protecting the planet earth. CESS has gone one step further by implicating some important programmes as stated in this issue of CESS News.

Based on the request from the Muhamma Panchayat in the Alappuzha district of Kerala and timely funding from KSCSTE, a one year action research programme was taken up for responsible ecotourism development, linking conservation with economic opportunities through showcasing of local environmental resources in the Pathiramanal island in the Vembanad lake. After detailed investigations an ecotourism plan was developed with extensive stakeholder interaction. Now, the Tourism Department has developed a project based on the recommendations of CESS. This programme has already received financial approval from the Government of India. There is already a budgetary allocation from the Government of Kerala for implementing this project.

Similarly an Integrated Coastal Zone Management Plan was prepared for Lakshadweep islands on behalf of the Ministry of Environment, Government of India. The plan prepared based on extensive surveys, data analysis and stakeholder interactions has now been approved by the National Coastal Zone Management Authority. Different action plans for the betterment of the environment, such as implementation of sewage treatment system and coastal protection plans have already been taken up by the island administration. A desalination plant has been commissioned to conserve the limited groundwater resources.

Another programme initiated on behalf of the Local Self Government Department is the training programme for the preparation of state of environment reports for the local bodies. Training of the trainers for this programme was initiated in the Engandiyoor Panchayat in the Thrissur District.

CESS always strives to promote science-society interaction and responds positively to any request from the society and the Government for the betterment of the environment. CESS also tries to interact with sister organizations and related departments and engage consultants wherever necessary to examine the issue at hand holistically. These action research projects are some of successful interventions of CESS for improving the environment and for sustainable development.

Dr.M.Baba

## ICZM..Lakshadweep.....continued from page 1

Major settlements/built-up areas, sand dunes and agricultural areas are some of the landuse categories demarcated on the map. In addition to this, the elevation mapping of the island with reference to Mean Sea Level (MSL) was also carried out to understand the micro-geomorphological features of the island. Majority of the islands have an elevation of 3 to 4 m above MSL. Patches of high sand dunes of > 5 m were observed at Kavaratti, Amini, Androth, Agatti and Minicoy islands. In many islands, destruction of sand dunes are noticed due to anthropogenic activities. In the marine areas of the island, fishing and boating facilities, ports, jetties, boat anchorages, water sports facilities, canning factories, oil terminals, waste outfalls and transportation systems are some of the multiple uses. All these were mapped. In the island, tourism is another activity, that has both resource and landuse components, leading to occasional conflicts. With closer dependance on marine resources, tourism can cause depletion of these resources. All these compelling arguments for multiple use strategies for coastal resources allocation have been collated and plans were prepared on a cadastral database. All these data sets were integrated with the development plan of the islands and an ICZMP was prepared. In this ICZMP, the conservation, preservation and development zones were also identified and action plans recommended. Coastal erosion and shore protection, fresh water management, conservation of coral reefs/ mangroves, sewage and solid waste treatment,

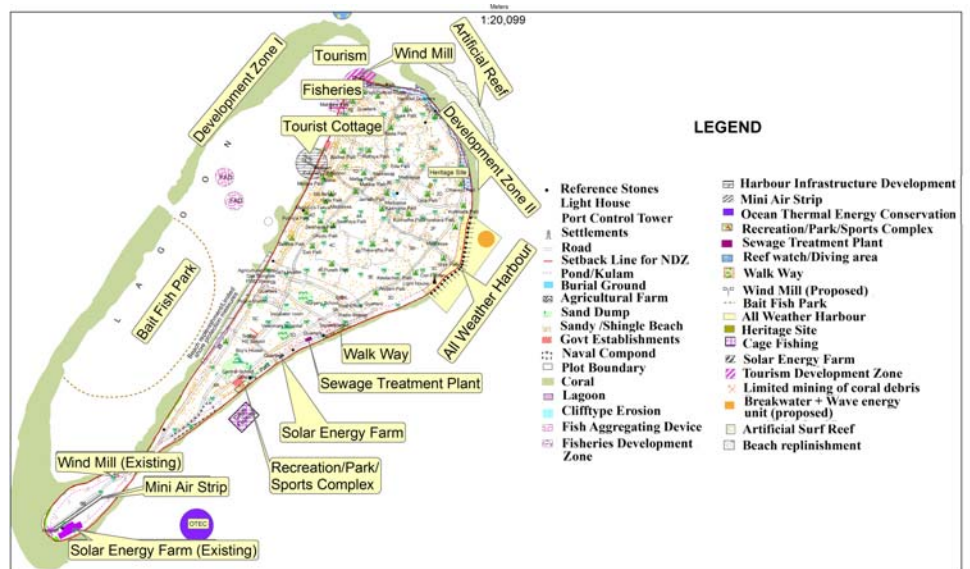
fishery resource exploitation and catch enhancement, tourism, infrastructure development, environmental awareness, implementation of CRZ rules, environmental quality enhancement and alternate employment generation were some of the major management issues considered while developing the ICZM Plan in the islands

### Stakeholders' participation in ICZM

For any plan to be successful the interaction with the stakeholders is a must. There are apprehensions among the island communities about the different issues, resource availability and developmental programmes undertaken by the Lakshadweep Administration. In this context, the ICZM Plan was discussed at different levels with various stakeholders' throughout the process of its development. The different management options for implementation were evolved through interaction with Island Council and prominent members of the local community.

The ICZM Plan preparation was a challenging task for CESS considering the quantum of work and logistic constraints for data collection and stakeholder interaction in the island. For the first time, ICZMP has been prepared for all the inhabited islands including Bangaram by taking into account the resources and the issues. The Lakshadweep Administration is implementing a project for safe sewage disposal. A desalination plant as recommended in the ICZMP has been installed at Kavaratti island. The tourism & coastal protection aspects are also being implemented in the islands.

-Dr. T.N.Prakash



ICZMP map of Kavaratti Island



## RAIN WATER HARVESTING: SUCCESS STORY OF A CESS INITIATIVE

A 35,000 cubic metre capacity artificial rain water reservoir was created in the premises of the Film and Video Park under the Kerala Industrial Infrastructure Development Corporation (KINFRA) under the guidance of CESS. It was a small abandoned pond widened and deepened to a one acre storage space for collecting rain water from the roof top and courtyards of all the buildings in the Park.



Rain water falling over an area of about 60 acres forms the catchment of this artificial water body. An earthen bund and flood overflow spillways were also constructed to drain out excess water over the reservoir capacity. A number of infiltration wells were also dug to collect subsurface water.

The optimal use of the ground water available in this coastal hamlet of Menamkulam, near the Kazhakkuttam junction and the Technopark is also taken care of by the groundwater experts. All the establishments in Film and Video Park are depending on this water resource throughout the year for their requirements.

### CESS RESEARCH COUNCIL RECONSTITUTED

The Research Council of CESS was reconstituted with Dr. Shailesh R Nayak, Director, Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Hyderabad as Chairman. Other members are Dr. Prithvish Nag, Director, National Atlas & Thematic Mapping Organization, Prof. V. Sundar, Head, Department of Ocean Engineering, IIT, Madras, Dr. V.S. Hegde, Dy. Director, ISRO Headquarters, Dr. P.V. Joseph, Visiting Professor, Cochin University of Science and Technology and Dr. V. Prasannakumar, Head, Department of Geology, University of Kerala. Dr. M. Baba, Director, CESS is the Member Convenor. The first meeting of the reconstituted Council was held during 4-7 June, 2007

### EARTH DAY 2007 FOCUSED ON CLIMATE CHANGE

The focal theme of Earth Day 2007 was 'Global warming and climate change'. The Global Warming due to Green House Effect has altered the global atmospheric processes and patterns. The world today is facing the massive environmental challenge to maintain a habitable Earth. CESS, as it had done in the past, observed Earth Day on April 23, 2007. Two hundred children



*Students get a feel of the Micro rain radar and Disdrometer installed in the Atmospheric Sciences Division for rain-fall and climate related studies*

and teachers from different schools in and around the Thiruvananthapuram city were invited. Fifteen laboratories of the Centre were opened to the public. Two video films on natural hazards produced by CESS were screened.

A quiz competition for students was organised in the afternoon. A talk on the conservation efforts of the Pamba, the holy river of Kerala, was made by Sri. N. K. Sukumaran Nair, General Secretary, Pamba Samrakshana Samiti, after the competition. Dr. E. P. Yesodharan, Executive Vice President, Kerala State Council for Science, Technology and Environment gave the Earth Day message to the students, guests and staff of CESS and gave away the prizes to the winners of Quiz competition. The meeting was chaired by Dr. M. Baba, Director, CESS and Dr. D. S. Suresh Babu, Scientist offered the vote of thanks.

### PUBLICATIONS

C. P. Rajendran, Kusala Rajendran, R. Anu, Anil Earnest, Terry Machado, P. M. Mohan, and Jeffrey Freymueller (2007): Crustal Deformation and Seismic History associated with the 2004 Indian Ocean Earthquake: A Perspective from the Andaman-Nicobar Islands. *Bulletin of the Seismological Society of America*, Vol. 97, No. 1A, pp. S174-S191.

N. Babu, D. S. Suresh Babu and P. N. Mohan Das (2007): Impact of tsunami on texture and mineralogy of a major placer deposit in southwest coast of India. *Environmental Geology*, 52, 71-80.

D. S. Suresh Babu, D. Padmalal and P. R. Arun (2007): Watershed analysis of two forest catchments from Western Ghats, south India and its significance for mitigation of reservoir siltation. *Jour. Geol. Soc. India*, Vol. 69, No. 5, 1077-1087

T. S. Shahul Hameed, N. P. Kurian, K. V. Thomas, K. Rajith and T. N. Prakash (2007): Wave and current regime of the south west coast of India, *Jour. of Coastal Research*, 23(5), 1167-1174.

C. K. Sasidharan (2007): Introducing Social water management concept in Water Management of Rural Area: Example from Tirurangadi Block, Kerala, in 'Groundwater 2007', Vol. II, pp 15-22

### PROJECTS COMPLETED

Feasibility of Quarrying Operations at Kottukunnu, Nellanadu (Project Report : Dr. Ajayakumar Varma)

Environmental Impacts of Mining and Processing of China clay: A Case Study from Velichikkala, Kollam District Kerala (Project Report : Dr. D. Padmalal)

### EXHIBITION

CESS participated in the exhibition organized by the Revenue Department in connection with the inauguration of State Disaster Management Authority from 9-10 May, 2007 at Central Stadium, Thiruvananthapuram.

### NOMINATIONS

Dr. M. Baba and N. P. Kurian were nominated as members of the Tsunami Core Group of the National Disaster Management Authority.

Dr. R. Ajaykumar Varma was nominated as member of the Working Group for drafting on Environmental Policy for the State.

## Lakshadweep Administrator visits CESS

Shri. B. V. Selvaraj IAS, Administrator, Union Territory of Lakshadweep visited CESS to have discussions with the scientists on the ongoing projects related to the islands and for further strengthening of the UT's relationship with the Centre. The administrator expressed appreciation for the ICZM Plan prepared for the eleven inhabited islands of the Territory. Shri. Selvaraj discussed in detail the management action needed for safe and scientific disposal of the sewage for the Kavarratti island under the UNDP sponsored pilot project. He pointed out that sewage disposal is a major problem faced by the island because of their miniscule size and fragile ecology. He had detailed parleys with the scientists on the innovative protection mechanisms required for the islands beaches. Administrator appreciated the involvement of CESS in the National Tsunami Warning System and also requested to give priority in undertaking the tsunami modeling programme for Lakshadweep islands.

### Pathiramanal.....continued from page 1

programme got underway as part of the project. Establishing a gateway at Kaipuram boat jetty, a natural history museum, an aquarium, a butterfly park, bird watching tower, a wilderness walk, a floating walkway around the island and rejuvenating the freshwater pond are some of the other schemes implemented soon as per recommendations given by CESS. The Agricultural University, the Kerala Forest Research Institute and the FIRMA, an NGO, will be developing different programmes to achieve the project goals. The Tourism Department executes the project with the Muhamma Grama Panchayat undertaking the overall management. CESS observed this year's World Environment Day (June 5, 2007) by organizing a seminar at Muhamma and presenting the action plan for Pathiramanal. Dr. T. M. Thomas Issac, Finance Minister, Government of Kerala has inaugurated the seminar. The government, according to the minister, has already made budgetary allocation of Rs. 50 lakhs to start the implementation of the plans. The Minister also informed that the Government of India has agreed to support this unique initiative with Rs. 5 crores. The seminar was attended by 300 people composed of stakeholders, local people, panchayat functionaries, NGO activists, representatives of the research institutions and the departments of tourism and fisheries. Dr. Srikumar Chattopadhyaya, Scientist, CESS coordinated the project.



Dr. M. Baba, Director CESS, inaugurates the workshop at Engandiyur, Thrissur Dt.

### CESS PARTICIPATED IN THE ICARB CAMPAIGN

CESS participated in the Integrated Campaign for Aerosol Radiation Budget and Trace Gases (ICARB) coordinated by the Vikram Sarabhai Space Centre to measure the carbon monoxide in the marine atmosphere over Bay of Bengal and the Arabian Sea. CESS also monitored surface ozone during this campaign that was conducted under the ISRO-Geosphere Biosphere programme involving twenty seven research institutions in the country, like the PRL Ahmedabad, IITM Pune, IIT Kanpur and IMD.

### SEMINAR/CONFERENCE/ WORKSHOP

Dr. R. Ajaykumar Varma attended Kerala Environmental Congress and presented a paper on 'State of Pollution of the Wetlands of Kerala – A Review' on May 8, 2007 organized by Centre for Environment Development, Trivandrum.

Dr. R. Ajaykumar Varma attended a two day workshop on 'Urban Sanitation Policy' at Hyderabad, during 12-13 June 2007, organized by the Ministry of Urban Development, Government of India and sponsored by the Water and Sanitation Programme of the World Bank.

Sri. C. K. Sasidharan presented a paper on 'Introducing social water management concept in water management of rural area: example from Tirurangadi Block, Kerala' in the National Seminar on 'Ground Water 2007 – Agricultural Development and Rural Drinking Water' organized by the All India Central Ground Water Board Officers Association at Bhopal during 4 – 5 April 2007

### ESSAY COMPETITION

Sri.K.R.Satheesan, Clerical Assistant of the Centre has won second prize in the all Kerala essay competition organised to commemorate the 50th anniversary of the first democratically elected government in Kerala conducted at the University College, Trivandrum.

### RETIREMENTS

Smt. Sarojini Amma, Office Assistant, Sri. K. K. Varghese, Technical Officer, Smt. C. Thulasi and Smt. Lyla Beevi, Typists of CESS retired from the services of the Centre during April-June period.

## STATE OF ENVIRONMENT OF PANCHAYATS: CESS JOINS HANDS WITH PEOPLE

Developmental programmes aimed at rapid economic growth and improvement in the standard of living of the people may affect the environment of a locality. Impact on the environment could be big or small and it could be negative or positive. In most cases, in our country, such impacts are often ignored or not properly taken care of before launching a developmental programme. The lack of environmental considerations during implementation of developmental projects is one of the major reasons for the worsening state of the environment. Uncontrolled and unscientific sand mining and quarrying activities, reclamation of wetlands and other water bodies, increased water pollution, increase in solid waste, damages to the ecology and biodiversity, rapid spreading of contagious diseases, etc. are some of the major threats every region of our State currently face. A large number of cases are pending in different courts that have stalled many projects and programmes aimed at economic development on environmental grounds.

CESS has initiated a programme with the people and the NGOs in the state for environmental evaluation and impact assessment of developmental programmes at the local level. Such an exercise will result in scrutiny of the projects and lead to viable suggestions and guidelines. Preparation of the State of Environment of Panchayats, thus, will lead to proper implementation of programmes that lead to sustainable growth.

This method, besides solving many problems locally, will lead to global environmental protection and better understanding of our own environment by the common man.

The State level inauguration of the training of trainers programme coincided with a workshop on the preparation of 'State of Environment Panchayat report, for peoples representatives, NGOs, officials etc., in Engandiyur Panchayat in Thrissur district during 16-17 June, 2007. Dr. Ajaykumar Varma and Dr. C. N. Mohanan, Scientists of CESS coordinated the programme, with assistance from the Local Administration Department, Kerala Sastra Sahitya Parishad. Dr. M. Baba, Director, CESS inaugurated the programme.