

Activity Report on APN Project 2000-07

1. Project Title:

Training Workshop for Capacity Building and Networking in the area of Biogeochemical Budgeting and Socio-Economic Modelling including Human Dimension Aspects, in the coastal systems of South Asia, 18-22 September, 2000, Mt. Lavinia, Sri Lanka

2. Funding:

APN Main Contribution	:	US \$ 21,500
APN Supplementary Contribution	:	US \$ 2,240
LOICZ contribution	:	US \$ 3,000
START contribution	:	<u>US \$ 2,500</u>
Total	:	<u>US \$ 29,240</u>

3. Participation

3.1 Trainees

The number of Trainees who attended from each of the participating countries with support from the above grants is given below.

APN-Member Countries	Number	Non-APN Countries	Number
Bangladesh	4	Maldives	2
India	1	Mauritius	2
Nepal	1		
Pakistan	3		
Sri Lanka	15		
Total	24	Total	4

There were 3 trainees nominated from India, but only one could come, as the other two had not received the clearance from the Government in time. The non-APN member country Trainees were supported by LOICZ and START.

3.2 Resource Persons

LOICZ arranged 5 resource persons (Netherlands, UK, USA, Philippines), and SASCOM arranged 2 from India. The National Committee has arranged one from Australia and another from USA

4. Background

The above workshop was organized by the Sri Lanka National Committee of the International Geosphere-Biosphere Programme, as a follow up activity to the scoping Workshop on Estuarine Modelling and Coastal Zone Management held by the Committee in April, 1999 in Colombo, with support from START and LOICZ.

The 1999 Workshop identified the need for capacity building in the area of BGC budgeting and for undertaking case studies on a few estuarine systems in the region. It was also realized that socio-economic and human dimension aspects in relation to coastal zones have received low priority among researchers in the region. The Workshop therefore proposed that a second workshop for coastal zone scientists in the region be organised, with a view to build their capacity to undertake the above studies

The formulation of the training programme and the identification of the key Resource Persons were kindly undertaken by LOICZ. The identification of the Resource Persons from the region and of the selection of the Trainees was undertaken by SASCOM of START.

5. Outline of Activities Conducted

The Workshop Programme included tutorial lectures, papers on regional issues, discussion of case studies, hands-on-training on BGC computer models and formulation of a Project Proposal for submission to APN seeking funding of follow up activities. These are described in detail below.

5.1 Tutorial Lectures

The following tutorial lectures were delivered by the Resource Persons.

- LOICZ Biogeochemical Modelling Guidelines - Chris Crossland
- LOICZ Biogeochemical Budgeting Procedures and Examples - Vilma Dupra
- LOICZ Computer Assisted Budget Analysis for Research, Education and Training (CABARET) - Laura T David
- LOICZ Tool: Quantifying Ground Water Flow - Laura T David
- Application of Community type Hydrodynamic Models in the Study of Sediment Transport - Charitha Pattiaratchi
- Consideration for Geochemical and Sediment Modelling: Important Controls and Alternative Methods - Steven L Goodbred
- Integrating Natural and Socio-Economic Sciences for Coastal Zone Management - Stephen Crooks

5.2 Papers on Regional Issues

- Coastal Zone Pressures and Estuaries - S N de Sousa
- Approaches to Regional Coastal Zone Problems - Mahesh D Zingde
- Management of Lagoons with Reference to Sri Lanka - Samantha Hettiarachchi
- Coastal Zone Pressures and Engineering Interventions in Coastline Protection - M Mannion.

5.3 Case Study Presentations

- River Discharge - Laura T David
 - Case I : Lingayen Gulf, Philippines
 - Case II: South China Sea
 - Case III: Laguna de Terminos, Mexico

- Sediment Transport in Negombo Lagoon, Sri Lanka - Saman Samarawickrama
- Studies in Periyar Estuary, Kerale, India - Hema Naik
- Sediment Transport Studies in North Australia - Charitha Pattiaratchi

5.4 Country Presentations

- Adapting to Impacts of Climate Change in the Coastal Areas of Bangladesh - A U Ahmed (Bangladesh)
- Some Dynamic Aspects of Modern and Ancient Meghna Delta of South-Eastern Bangladesh Coast in terms of land Accretation and Erosion - A S M M. Kamal (Bangladesh) | Ahsan Uddin Ahmed
- Modelling Pollution Transportation to the Coastal Zone through Ground Water Systems using GIS - S Shahid (Pakistan)
- Modelling Oceanward Sediment Flux of the South and South-East Asian Rivers - K P Sharma (Nepal)
- Population Fluctuation of Eleven Species of Aquatic Avifouna in and around Tissa Wewa Reservoir - W A H P Guruge (Sri Lanka)
- A Model for Tidal Response of a Choked Lagoon on the West Coast of Sri Lanka - J K Rajapaksha (Sri Lanka)
- Chemical Speciation Study of Lead (Pb) and Cadmium (Cd) with Bicarbonate, Hydroxide in Artificial Seawater and Dissolved Organic Matter in Seawater by applying DPASV - M Nabi, A H Khan and A Hussan (Bangladesh)
- Current Work on Nutrient Analysis in Estuaries and Sea of Port Louise Region and Flic-En-Flac - V Ramasahye (Mauritius)
- Socio-Economic Modelling of Coastal Zone Tourism - S Nath (Mauritius)

5.5 Hands-on-Training

The Trainees were provided with 10 computers to develop BGC budgets corresponding to their own sites. The Resource Persons supplied the necessary software and personally instructed the Trainees how to carry out the exercises. These exercises were done in several stages:

- Step 1: Development of Salt Budget
- Step 2: Development of Salt-Water Budget
- Step 3: Development of Salt-Water-Nitrate Budget
- Step 4: Development of Phosphate Budget

All the Trainees did not possess the necessary input data required to develop these budgets. Hence, for the purpose of practicing, hypothetical values for various parameters were made use of. The intention was for the Trainees to collect the necessary data on their return and develop more authentic budgets. Each Trainee was given diskettes containing the software.

6. Workshop Outcome

The following could be listed as the main outcome of the Workshop.

6.1 Capacity Building

The Workshop provided adequate opportunities for the Trainees to build their capacity in the development of Biogeochemical Budgeting, using both LOICZ models and Community Models available on the Web. The necessary software and computers were made available and most Trainees did develop provisional budgets corresponding to sites in their home countries. LOICZ may incorporate some of these in one of their publications.

The Socio-Economic Modelling aspect however, took only a secondary position. The reason being that, for this area, there were only a few Trainees, and also only one Resource Person was present. These Trainees were given lectures highlighting various aspects of social impacts and methodologies for undertaking socio-economic studies, but there was no opportunity for them to develop any models as such. The S-E Group however, discussed the data needs and impacts in separate sessions.

6.2 Networking

The Trainees came from the leading Research Institutions on Oceanography and Marine Sciences, and the University Departments studying Coastal Science and Engineering, in the region. After having stayed more than 5 days together and discussed matters of mutual interest during this period, these trainees are now in a position to continue their dialogue and rapport in the future as well. With the proposed project, opportunities will be available to exchange visits among them, binding firmly the network. Also, the opportunity provided by the Workshop to get to know the Resource Persons was helpful, as they assured them of their continued availability for any advice or consultation.

6.3 Proposal for a Follow-up Project

The main product of the Workshop was the Proposal developed for a Regional Project to undertake follow up activities with the participation of seven countries, including Australia and USA. The project was titled “An assessment of nutrients, sediments and carbon fluxes to the coastal zone in South Asia and their relationship to human activities.” The participating countries are: Australia, Bangladesh, India, Nepal, Pakistan, Sri Lanka and USA. The proposal has already been submitted to the APN Secretariat seeking funds for a two-year period.

7. Follow up Work

It is envisaged that during the next two years, it would be possible to focus on the synthesis of data and develop the socio-economics modelling capability, which was not adequately addressed in the workshop. Each group is expected to gather data that are already available with various agencies in order to develop the Budgets using the methodologies taught at the Workshop. They will also identify gaps in the current knowledge and the facilities that are required to obtain data in such areas. The groups will endeavour to integrate the proposed activities with existing programmes initiated with national resources, wherever possible. The acceptance of the proposal submitted to APN for a new project will greatly facilitate this exercise.

8. Project Leader

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**APN/SASCOM/LOICZ Regional Training
Workshop on Biogeochemical Budgeting and
Socio-Economic Modelling for Coastal Scientists**

18-22 September, 2000, Colombo

PROGRAMME

18th Monday

0830 h Registration

0900 h Inauguration Ceremony

1000 h T E A

**Session I - Biogeochemical Budgeting and Analysis
Part I**

Resource Persons:

Prof. Chris Crossland (LOICZ Int. Project Office, Texel, Netherlands)

Dr Laura David (Marine Science Institute, University of Philippines)

Ms Vilma Dupra (Dept of Oceanography, University of Hawaii)

1030 h LOICZ Approach for first-order CNP estuarine models and budgets
Introduction to LOICZ budget approach, including:

- LOICZ Tutorial and CABARET calculation program
- Tools
 - Waste input estimates
 - Groundwater inputs
 - Run-off estimations
- Upscaling from site to regional assessment
 - LOICZ Typology approach
 - LOICZ Website
- Budget tutorial, case study (stratified, multiple and single horizontal box estimates)

1300 h L U N C H

Part II

Resource Persons:

Prof. Charitha Pattiaratchi (Coastal O'graphy Group, U/Western Australia)

Prof. Steve Goodbred (Marine Sc. Res. Center, State Univ. of New York)

1400 h Modelling Applications

- Complex BGC modelling
- Sediment dynamics and modelling

1600 h T E A

- 1630 h Presentations by Participants
- Review of participant sites and data
 - Applications and potential for use in region

1730 h Individual BGC Budget Development

19th Tuesday

Session II - Economic - Environmental Modelling

Resource person:

Mr Douglas McGlone (Marine Science Institute, U/ Philippines)

- 0900 h Plenary Presentation covering:
- Purpose and needs
 - START/LOICZ approach (per SWOL project experience)
(determining residual production and links to economic sectors)
 - Issues
 - Data and information requirements
 - Tutorial on concepts and approach
 - Case study example (Philippines site)

1030 h T E A

- 1100 h Presentation by Participants
- Review of participants' sites and data
 - Application and potential for use in region

1300 h L U N C H

Session III - Integration of Natural Sciences with Socio-Economics

Resource Person:

Dr Stephen Crooks (School of Env. Sciences, Univ. of East Anglia)

- 1400 h Plenary Presentation covering
- Purpose and Needs
 - Setting up a framework
 - Data and information needs
 - Ecological Economics

1530 h T E A

- 1600 h Presentation by Participants
- Review of participant sites and data
 - Application and potential for use in region

1700 h Individual Socio-Economics Model Development

20th Wednesday

Session IV - Regional issues on Coastal Zone Pressures Part I

Resource Person:

Dr S N de Sousa (Chem. O'graphy Div., Nat. Inst. of Oceanography, Goa)

- 0900 h Coastal Zone Pressures and Estuaries
- 1030 h T E A
- 1100 h Break out groups doing hands on modelling/budgets with own data or with supplied information for a case study, under tutelage of resource people.
- Groups to include: a. BGC budgets and Sediment Modelling
 b. Socio-Economic and Integrated Modelling
- 1300 h L U N C H

Session IV - Regional issues on Coastal Zone Pressures Part II

Resource Persons:

Prof. Charitha Pattiaratchi

Prof. Steve Goodbred

- 1400 h Coastal Zone Pressures and Catchments and River Basins
- 1530 h T E A
- 1600 h Break out groups discussions
- 1700 h Plenary: Discussion on progress and problems.

21st Thursday

Session V - Approaches to Regional Coastal Zone Problems

Resource Person:

Dr Mahesh D Zingde (NIO Regional Centre, Mumbai)

- 0900 h Plenary Presentation
- 1030 h T E A
- 1100 h Break out groups discussions
- 1300 h L U N C H

Session VI - Plenary

- 1400 h Report back on budgets and models outcomes, problems and needs
- 1530 h T E A
- 1600 h Identify further application and training opportunities
- 1700 h Further Individual Model Development

22nd Friday

Session VII - Plenary

- 0900 h Presentation of Project Concepts by Country Representatives
- 1030 h T E A
- 1100 h Discussion and Preparation of Regional Project(s) Proposals
- 1300 h L U N C H
- 1400 h Presentation of Regional Project(s) Proposal
- 1530 h T E A
- 1600 h Concluding Session
- 1630 h Closure of Workshop

APN/SASCOM/LOICZ
Regional Training Workshop on Biogeochemical Budgeting and
Socio-Economic Modelling for Coastal Scientists
18-22 September, 2000, Colombo, Sri Lanka

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