



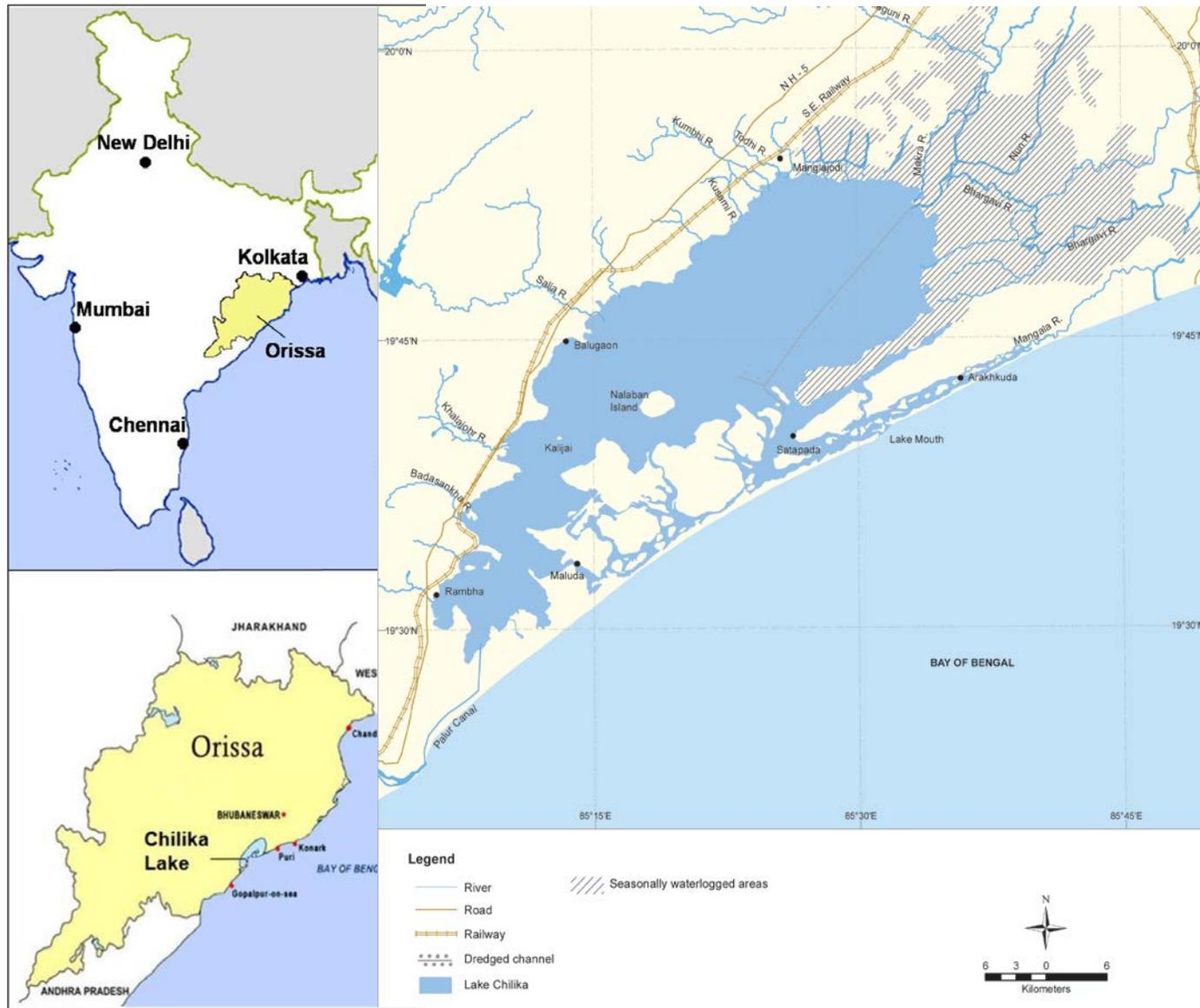
Linking Wetlands and Water Management

The case of Lake Chilika, India

Dr. Ajit Pattnaik , Chilika Development Authority

Dr. Ritesh Kumar, Wetlands International South Asia

Chilika



Chilika



Hotspot of biodiversity

211 bird species; largest Irrawady Dolphin population; 217 fish species



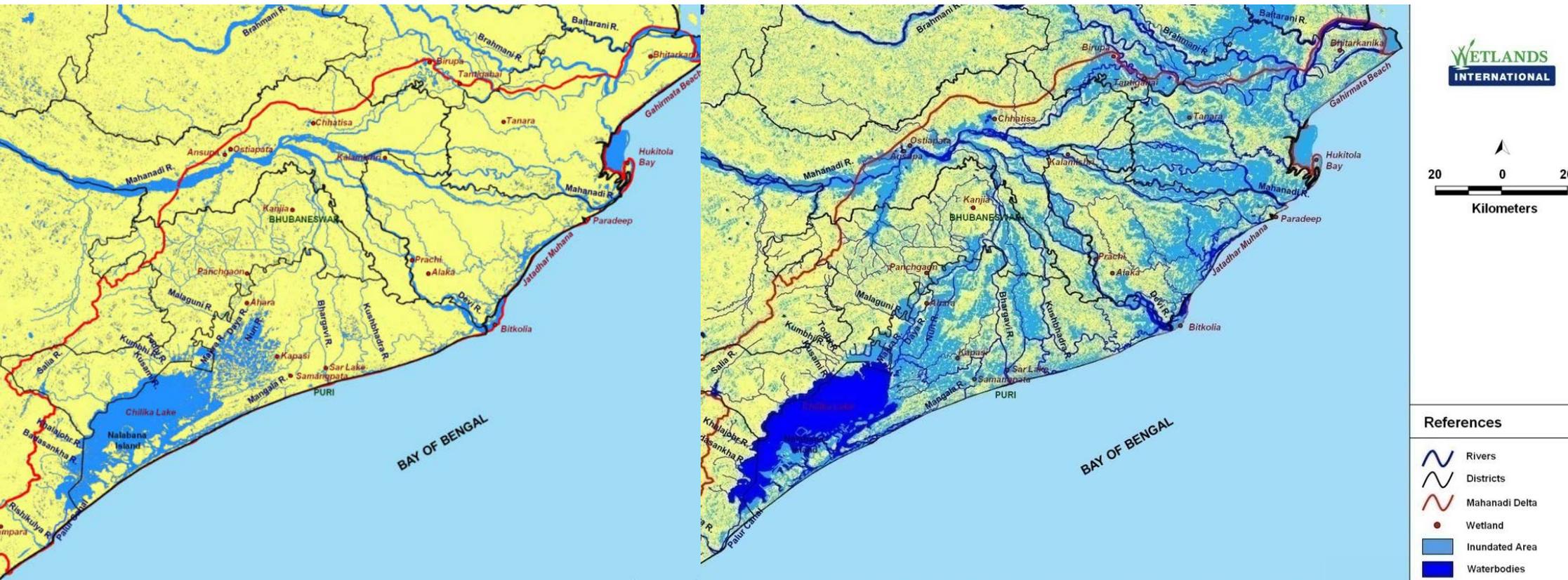
Chilika



Livelihood base of 0.2 million fishers

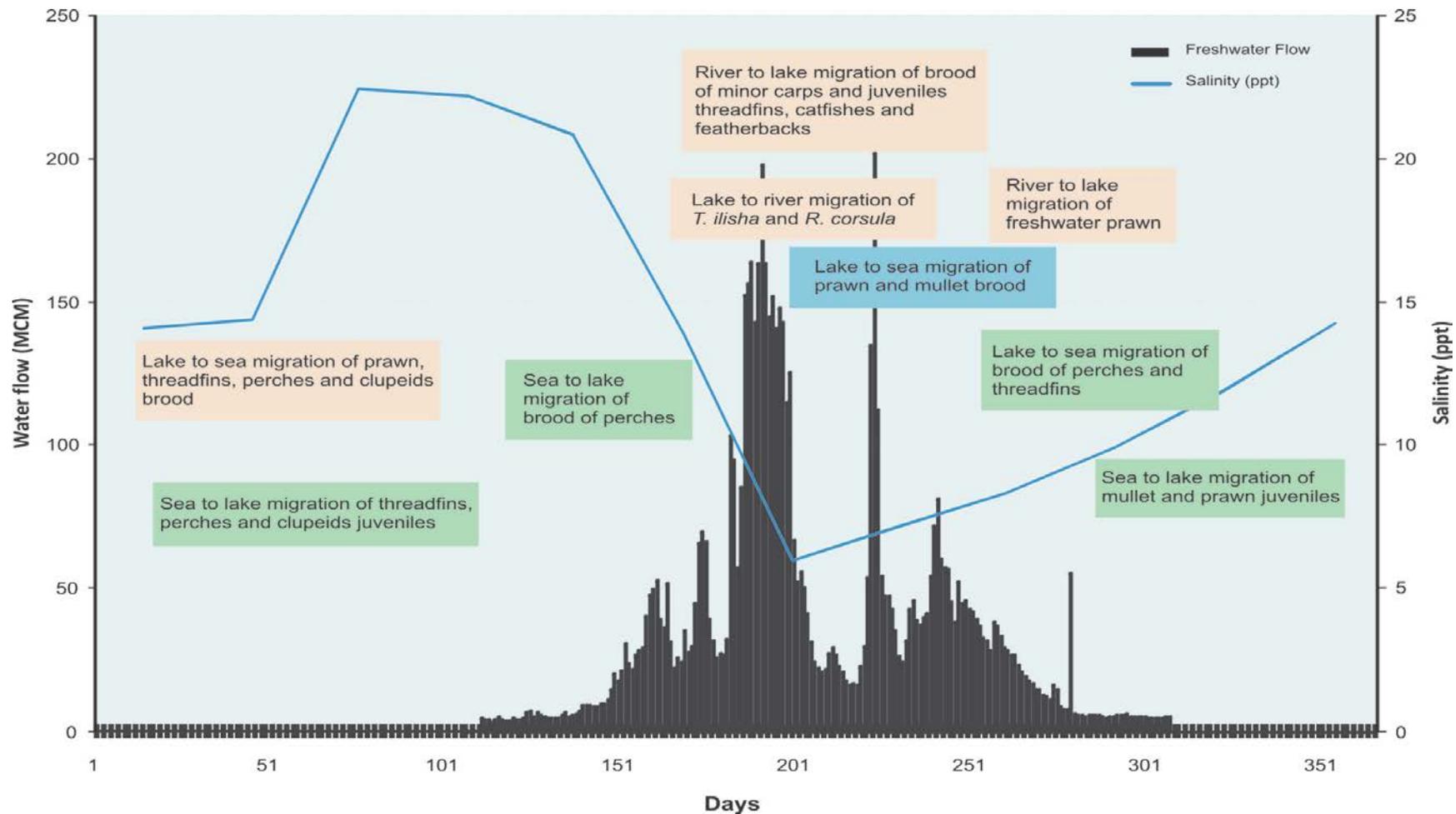


Chilika : Riverine and Coastal Processes



Dynamics of water, sediment, nutrient and species exchange defines ecosystem services of diverse wetland regime

Chilika : Riverine and Coastal Processes



314 fish species (64 true freshwater, 94 marine and 156 brackish water species); 29 species of prawn; 35 species of crab

62 species contribute to the commercial landing

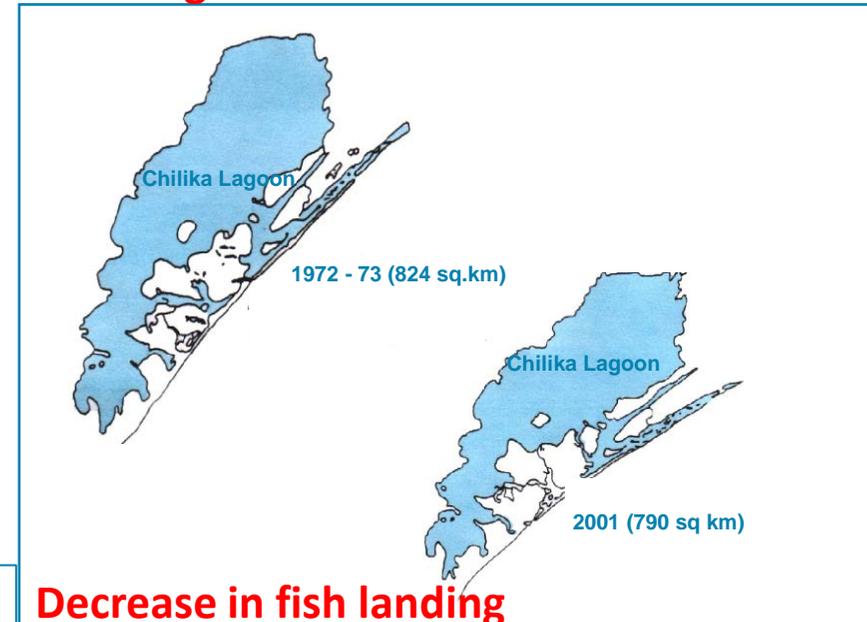
Lake degradation

Choking of mouth to the sea

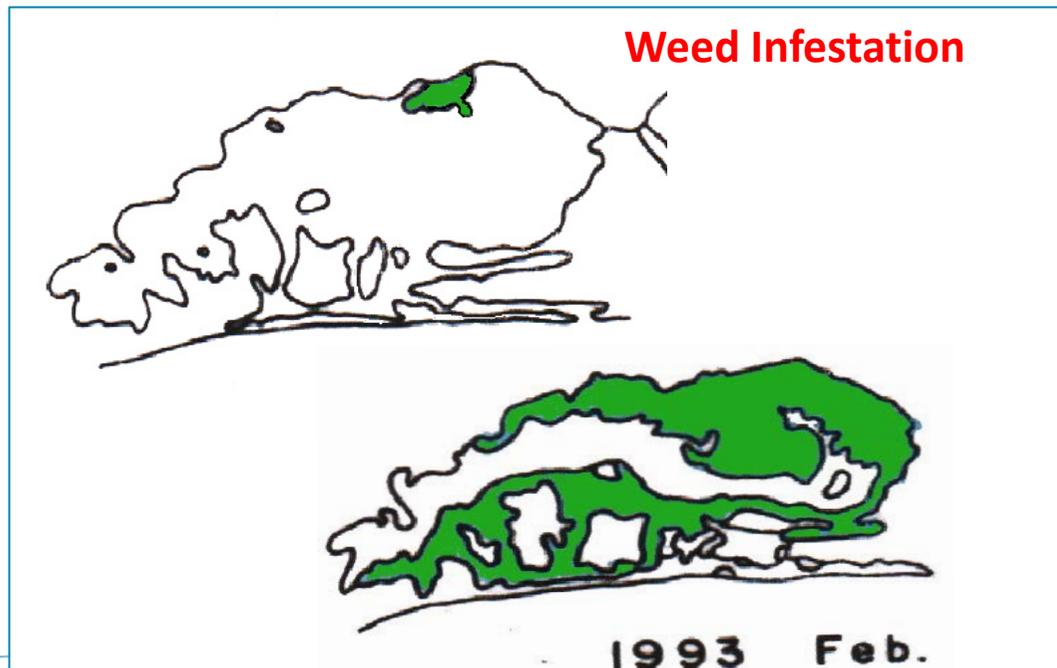
Dominance of freshwater environment

Included in Montreaux Record in 1993

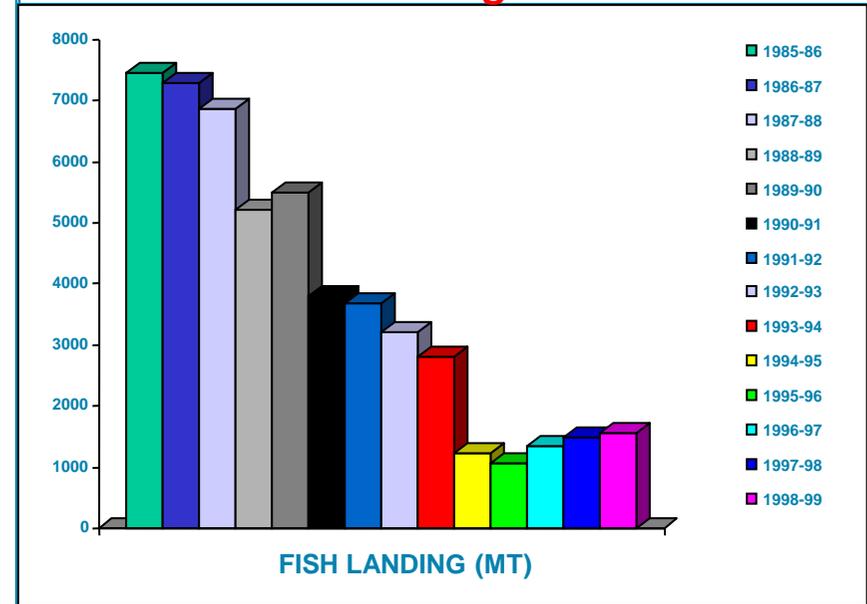
Shrinkage in lake area and volume



Weed Infestation



Decrease in fish landing



Putting governancne in place



Executive Body

Chair: Principal Secretary (Forest and Environment)

Member: Director (Environment)

Convenor: Chief Executive, CDA

Creating Strategic Partnerships

Research Institutions

NIO, Goa
CWPRS, Pune
IIT, Madras
CIFRI, Kolkata
NRSA, Hyderabad
BNHS, Bombay
ZSI
BSI
Utkal University
Berhampur University
CDS, Bhubaneswar
KIIT, Bhubaneswar
NISER, Bhubaneswar

International and National Organizations

Wetlands International
Ramsar Centre, Japan
JICA, Japan
JFGE, Japan
DHI, Denmark
Ministry of Environment and Forests, India
Space Application Centre, India
ICMAMPD, Chennai
ICZMPD, Bhubaneswar

Chilika Development Authority

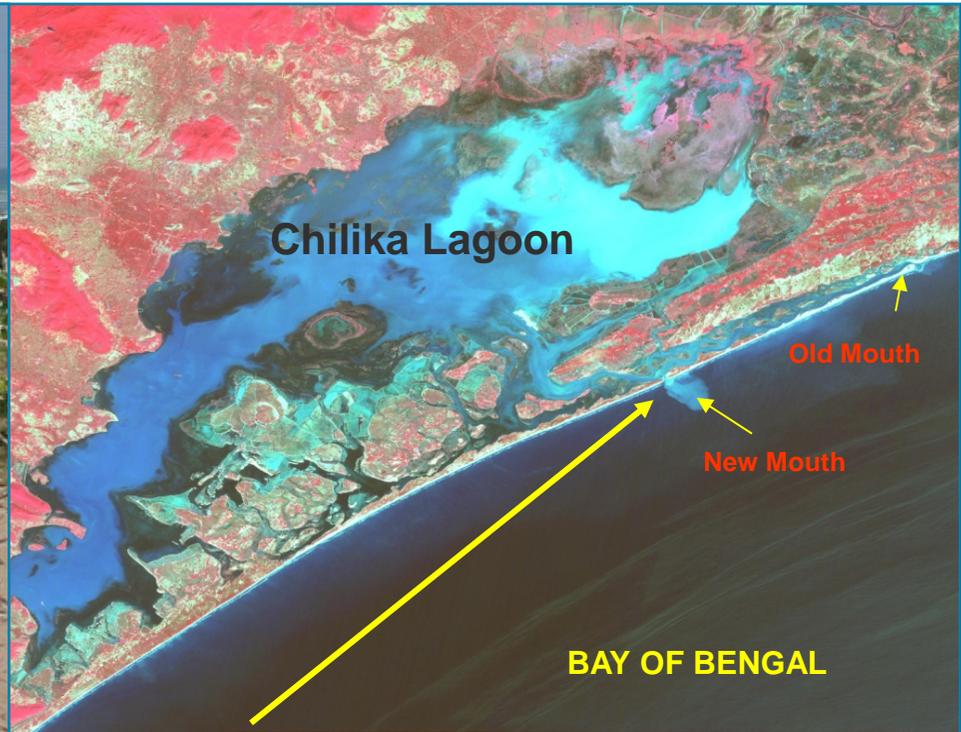
Community Based and Non Governmental Organizations

Bird Protection Committee
CCCL, Chilika
Centre for Environment Education
Primary Fishermen Cooperative Societies
Watershed Communities
Wildlife Orissa
Women Self Help Groups

State Government Departments and Agencies

Department of Agriculture
Department of Fisheries and Animal Resources Development
Department of Revenue and Disaster Management
Department of Water Resources
Orissa Remote Sensing Application Centre

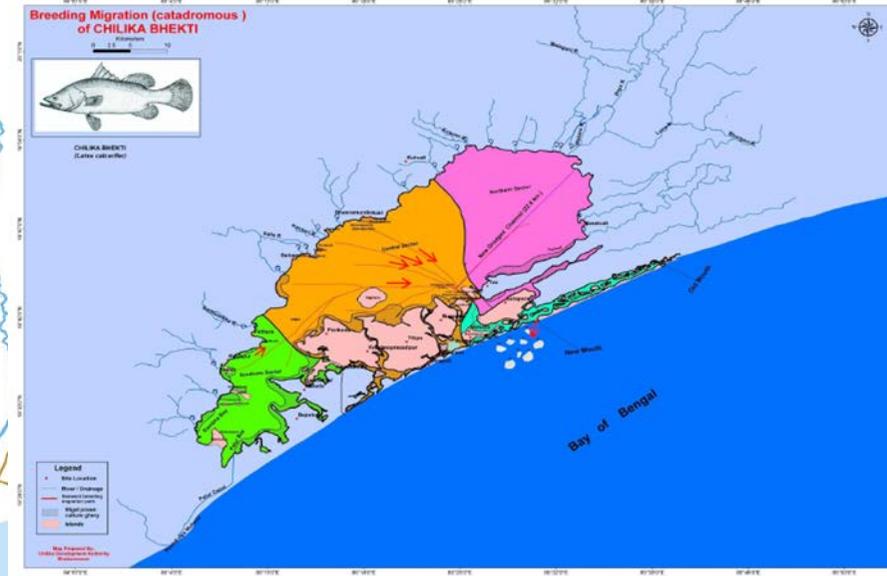
Hydrological Intervention - 2000



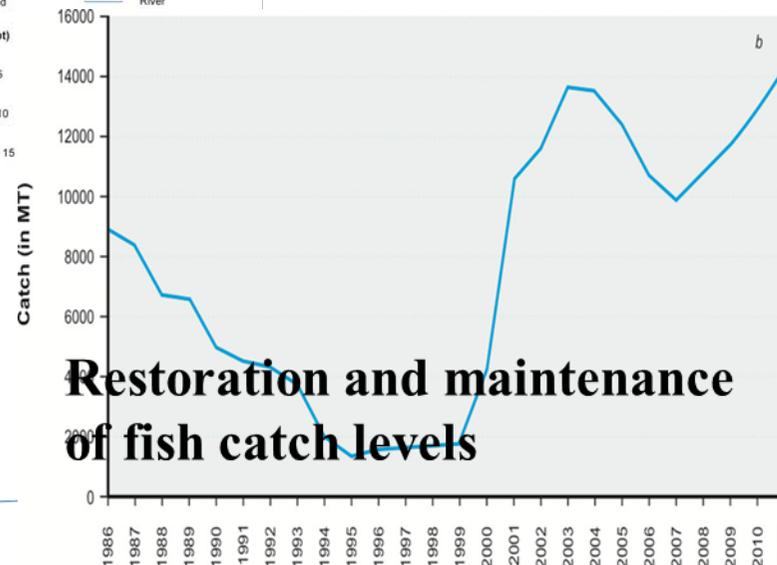
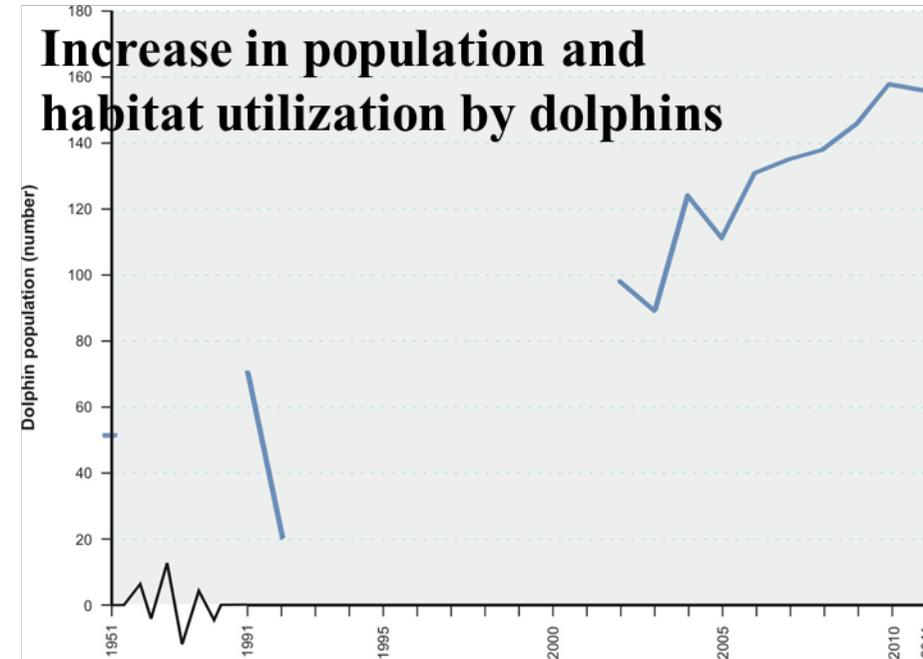
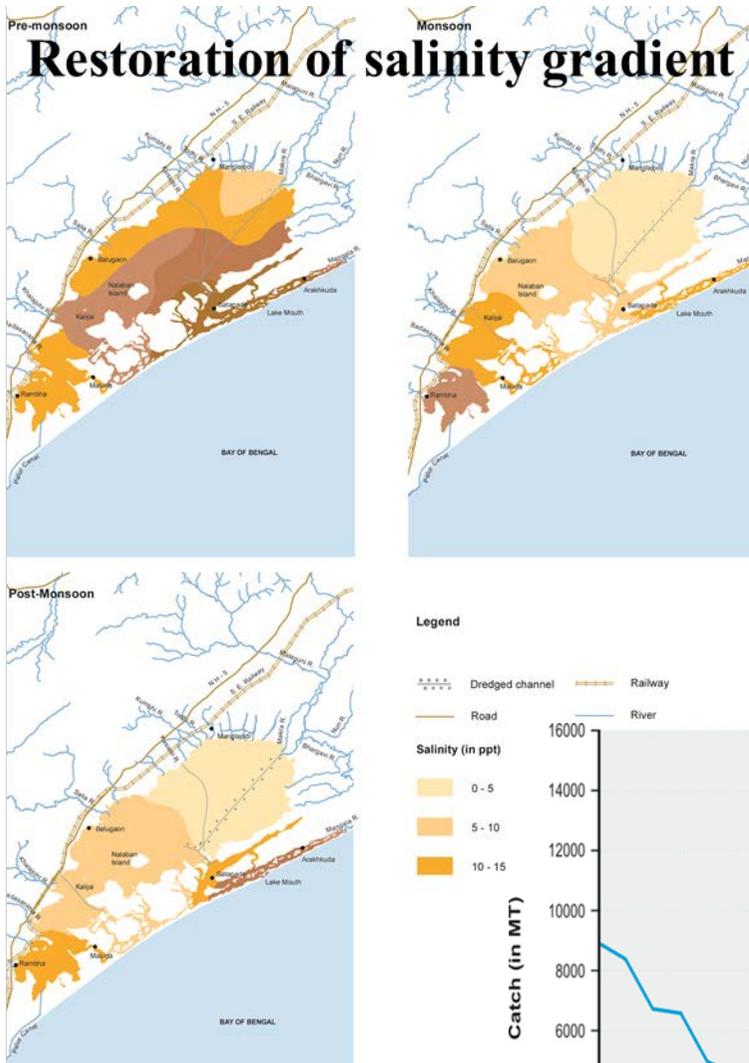
Rejuvenating
sea
connectivity



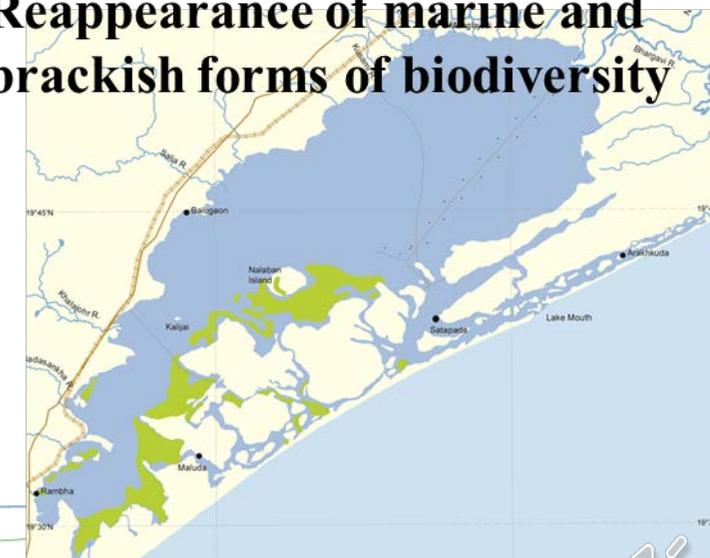
Creating knowledge base



Reviving ecology



Reappearance of marine and brackish forms of biodiversity



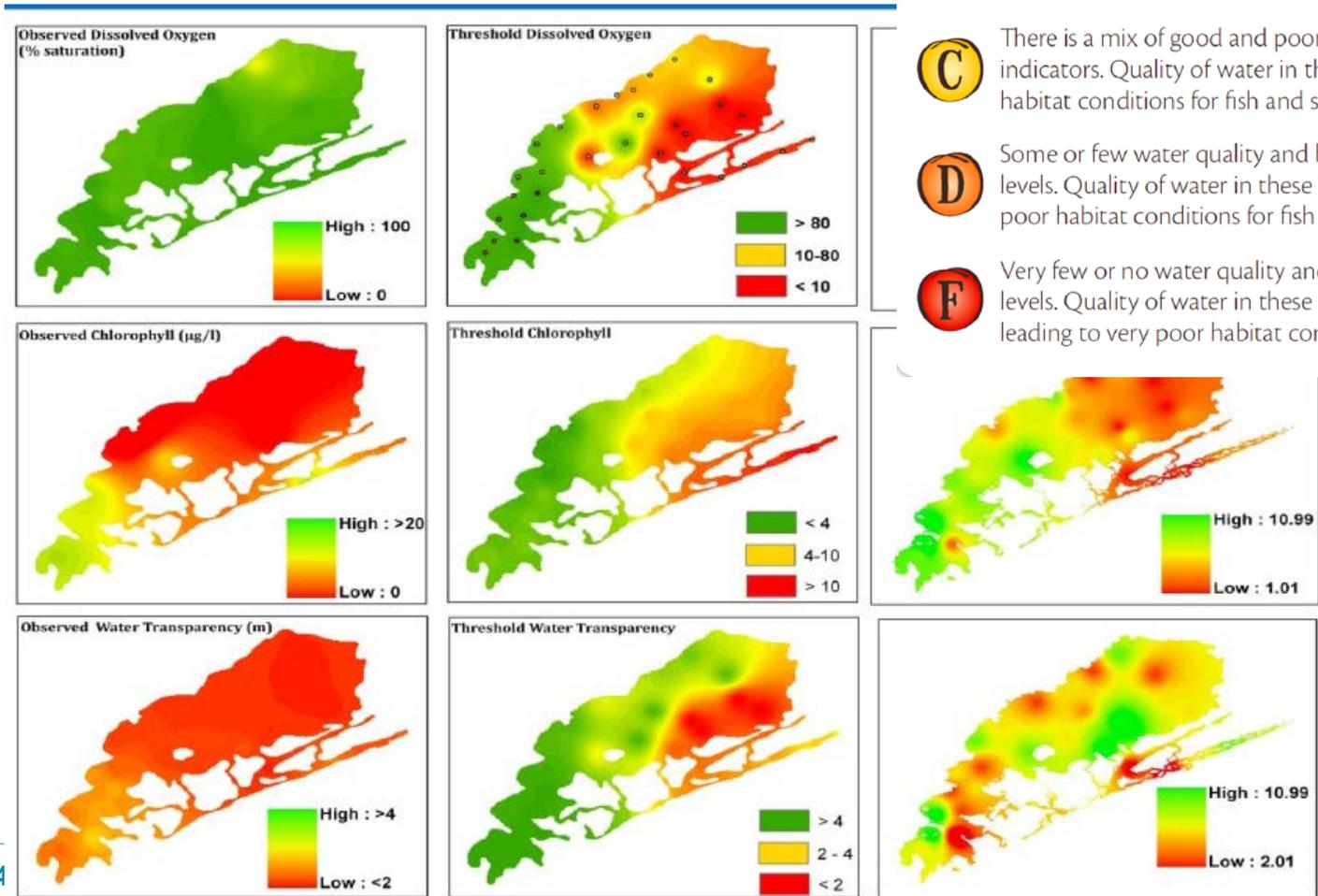
Communicating Chilika



- Wetland Interpretation Center
- Wetland Research and training center

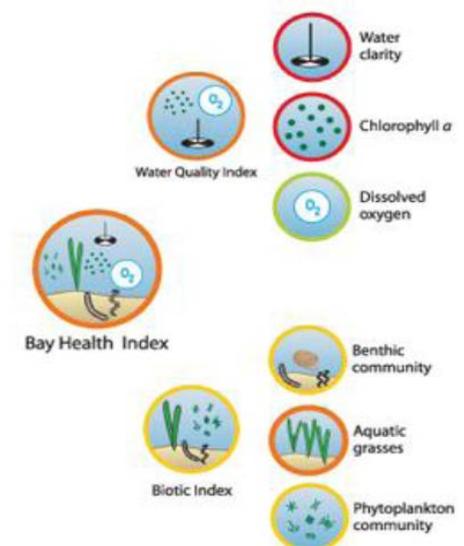


Communicating Chilika

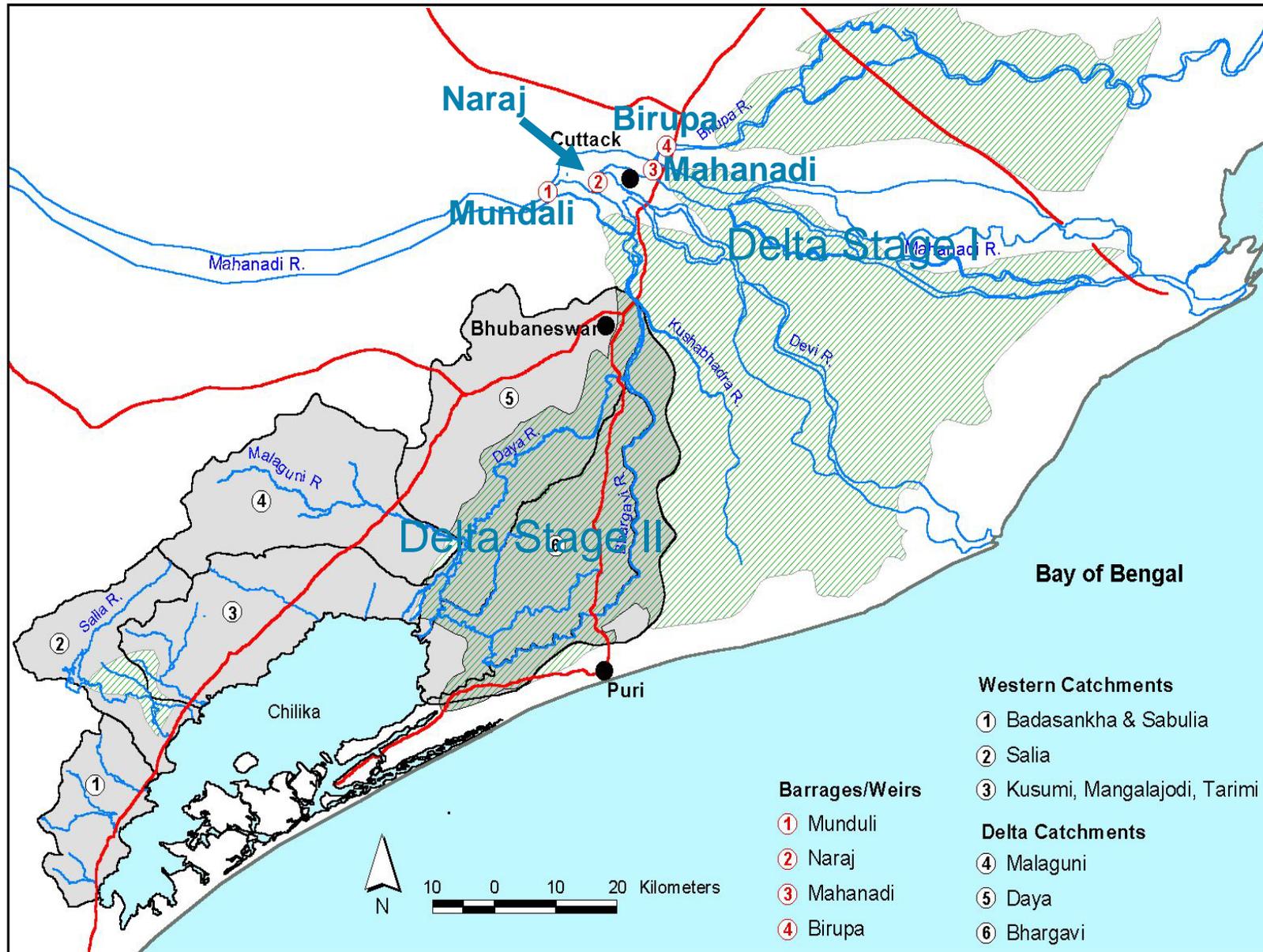


What do the grades mean?

- A** All water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be very good, most often leading to very good habitat conditions for fish and shellfish.
- B** Most water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be good, often leading to good habitat conditions for fish and shellfish.
- C** There is a mix of good and poor levels of water quality and biological health indicators. Quality of water in these locations tends to be fair, leading to fair habitat conditions for fish and shellfish.
- D** Some or few water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be poor, often leading to poor habitat conditions for fish and shellfish.
- F** Very few or no water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be very poor, most often leading to very poor habitat conditions for fish and shellfish.



Decision making



Defining Flow Scenarios

Scenario 1: Pre Barrage

60% undivided Mahanadi flow through Naraj

Scenario 2: Multi Objective

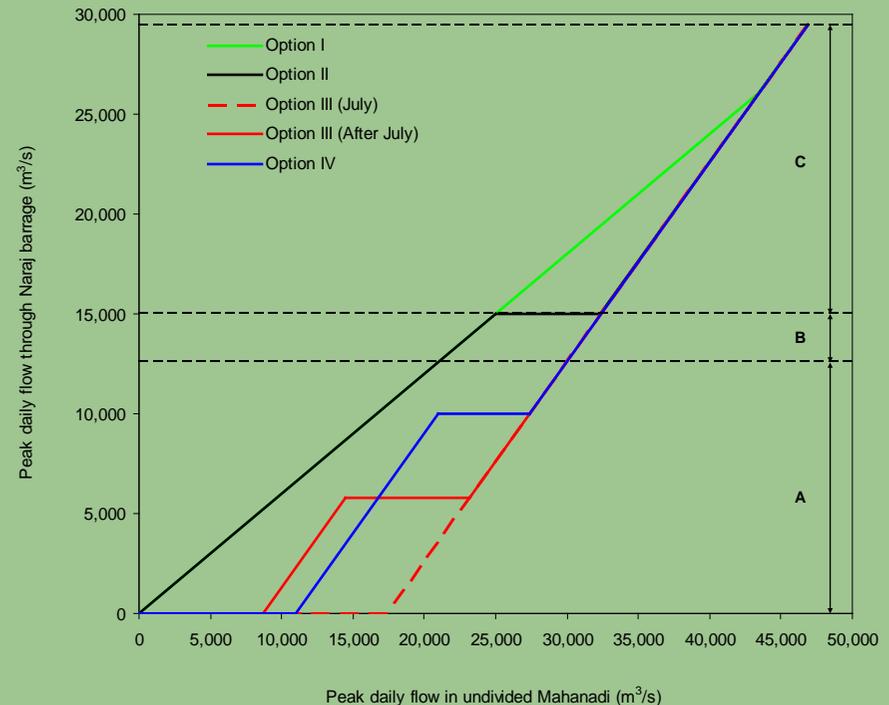
Regulate flows above 15,000 m³/sec to control large floods d/s Naraj

Scenario 3: Sediment Control

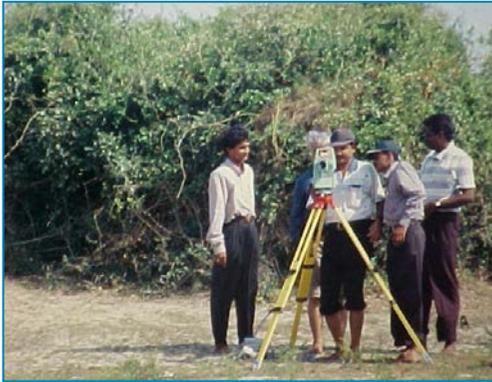
No flows in July , first month of monsoon

Scenario 4: Euroconsult II

Control sediments and minimize structure failure risk



Flow perceptions



Structural
Engineers

Reduced flows ->
Reduced silt ->
Longevity of
wetland systems



Fishers

Floods - > Flush the
system and keep
mouth open -> high
fish productivity



Farmers

Floods - > bring silt -
> high agricultural
productivity
Embankments
create waterlogging

Knowledge Systems

Scientific measurements



Anecdotal

Economics for communication

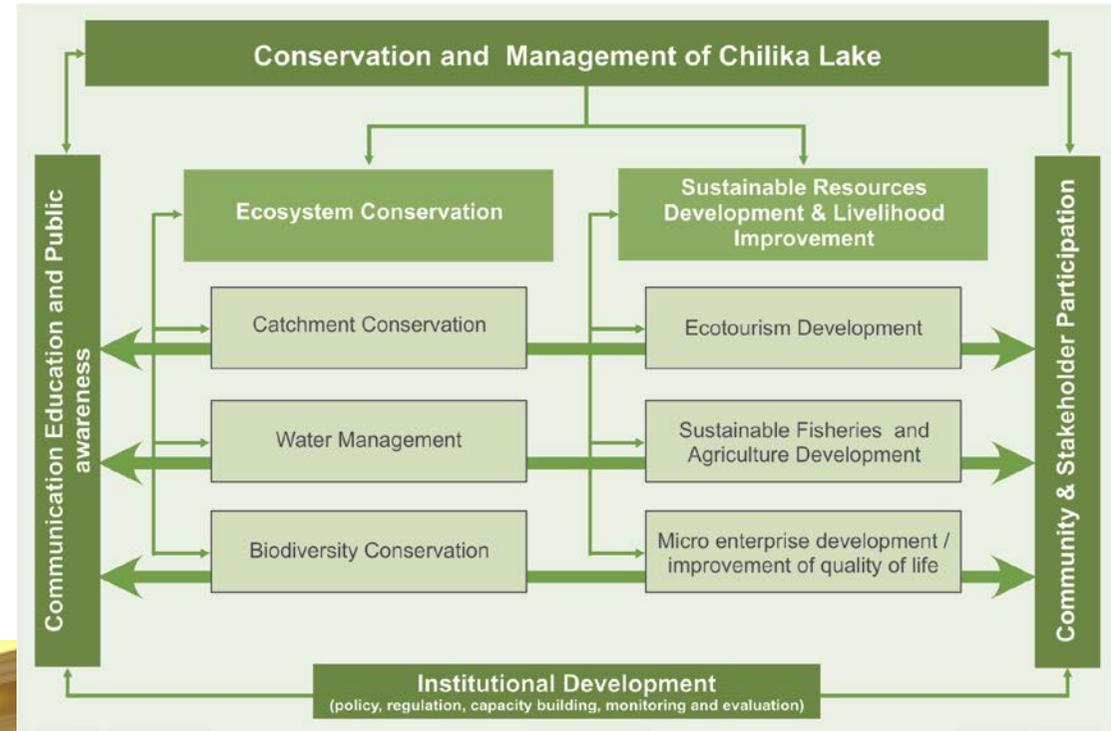
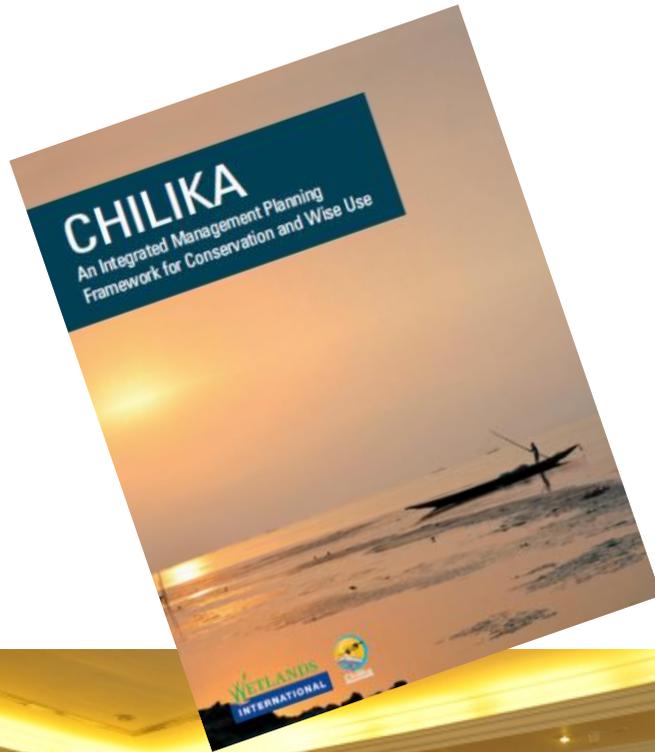
- Incremental cost benefit analysis indicated **annual loss of US\$ 604 million** due to proposed reduction in freshwater flows by 60%
- Maintaining present levels of freshwater flows **would lead to annual benefit of US\$ 10,930 million** through fisheries and agriculture

Sharing restoration benefits



- Regulating destructive fishing through Chilika Fisheries Rules
- Building capacity of Fisher Cooperatives
- Incentives -> better storage systems for higher values
- Conservation strategies, participatory mapping of fish migratory routes
- Institutional strengthening for 'responsible fisheries'

Integrated management planning



Challenges

- Responding to climate change
- Scaling to river basin



In Conclusion

- Wetland management needs adaptive institutions with ability to work at multiple scales and engage with diverse stakeholders
- Managing social transformation an equally important component of ecological restoration
- Crucial role of effective decision making structures
- Investing into multiple knowledge base systems to benefit from cutting edge science as well as traditional knowledge
- Institutional collaborations and partnerships strengthen adaptive management and ability to respond



Wetlands and Water Management

Lake Chilika

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