MANGROVE MANAGEMENT AND RESTORATION

- MILESTONES AND PERSPECTIVES 1972 TO 2002
- MANGROVES IN THE SOUTH CHINA SEA
- CHALLENGES
- NEEDS

KEY MILESTONES IN INTERNATIONAL OPINION REGARDING THE ENVIRONMENT

1972 STOCKHOLM - CONFERENCE ON THE HUMAN ENVIRONMENT

1992 RIO - CONFERENCE ON ENVIRONMENT & DEVELOPMENT

2002 JOHANESBURG - THE EARTH SUMMIT

CHANGE IN PERSPECTIVE FROM

- PROTECTION, TO
  - CONSERVATION, TO
    - SUSTAINABLE USE.

1972 STOCKHOLM - CONFERENCE ON THE HUMAN ENVIRONMENT

KEY PROBLEM FOR THE MARINE ENVIRONMENT

PERCEIVED AS BEING POLLUTION FROM MARITIME TRANSPORT AND LAND-BASED ACTIVITIES

ACTIONS INVOLVED:

- INSTALLING COMPLEX MONITORING SYSTEMS
- SOLUTIONS DIRECTED TOWARDS MITIGATING LBA IMPACTS THROUGH "END OF PIPE" SOLUTIONS & SHIP BASED THROUGH VARIOUS IMO CONVENTIONS

BY 1992 CHANGE IN PERSPECTIVE FROM END OF PIPE CLEAN-UP TO CONTROLLING LAND-BASED POLLUTION SOURCES

1992 RIO - CONFERENCE ON ENVIRONMENT & DEVELOPMENT

MARINE POLLUTION WAS CONSIDERED LESS IMPORTANT THAN:

- OVER - EXPLOITATION OF FISH STOCKS
- DEGRADATION AND LOSS OF COASTAL HABITATS

THE EMPHASIS IN ENVIRONMENTAL PROTECTION HAD CHANGED FROM

- PROTECTION OF INDIVIDUAL SPECIES, TO
  - CONSERVATION OF HABITATS

AGENDA 21 CALLED FOR THE DEVELOPMENT OF INTEGRATED COASTAL ZONE MANAGEMENT PLANS BY ALL COUNTRIES

INTEGRATED COASTAL ZONE MANAGEMENT IMPLIES:

- OBJECTIVITY
- BALANCE BETWEEN CONFLICTING USES/SECTORS/INTERESTS
- CONSENSUS OR AGREEMENT REGARDING GOALS AND TARGETS
- SOUND SCIENTIFIC APPROACHES TO, DATA AND INFORMATION COLLECTION, MANAGEMENT AND USE
- PREDICTIVE MODELS OF PHYSICAL, BIOLOGICAL AND SOCIO-ECONOMIC PROCESSES AND THEIR INTERACTIONS

SINCE THESE PRE-CONDITIONS ARE RARELY, IF EVER MET THE BEST ONE CAN HOPE FOR IS:

CROSS-SECTORAL PLANNING

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THE EMPHASIS HAD CHANGED FROM:

- **HABITAT CONSERVATION, TO**
- **"ECOSYSTEM MANAGEMENT"**

"ECOSYSTEM MANAGEMENT"
A NEW PARADIGM OR AN OXYMORON?

DOES IT REPLACE:
INTEGRATED COASTAL ZONE MANAGEMENT AND COASTAL AREA MANAGEMENT?

IF NOT THEN HOW DOES ICZM RELATE TO ECOSYSTEM MANAGEMENT?

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THE TERM "ECOSYSTEM MANAGEMENT" IMPLIES THAT MANAGEMENT INTERVENTIONS CAN BE EXECUTED THAT RESULT IN:

DEFINED AND PREDICTABLE CHANGES IN NATURAL SYSTEMS

BUT WE CAN NEITHER MODEL NOR, PREDICT CHANGES, IN ANIMAL AND PLANT POPULATIONS AND COMMUNITIES;

HENCE WE CANNOT PREDICT WITH ANY DEGREE OF CERTAINTY WHAT THE CONSEQUENCES OF HUMAN ACTIONS WILL BE.

BEST ONE CAN HOPE FOR IS TO MANAGE HUMAN ACTIVITIES THAT IMPACT THE ENVIRONMENT

2006 EAST ASIAN SEAS CONGRESS

WORKSHOPS ON:

ECOSYSTEM BASED MANAGEMENT

HABITAT MANAGEMENT AND RESTORATION

EMPHASIS IS ON MANAGEMENT OF HUMAN ACTIONS TO MINIMISE ADVERSE CONSEQUENCES OF HUMAN USE

ULTIMATE OBJECTIVE OF MANAGEMENT IS TO:

MAXIMISE HUMAN BENEFITS AND MINIMISE ADVERSE IMPACTS OR ENVIRONMENTAL COSTS

MANGROVE BIOLOGICAL DIVERSITY IN THE SOUTH CHINA SEA

- 41 GENERA OF TRUE MANGROVES IN THE INDO-WEST PACIFIC COMPARED WITH ONLY 5 GENERA IN THE ATLANTIC;
- THE MOST DIVERSE MANGROVE STANDS OCCUR IN SOUTHEAST ASIA WITH UP TO 42 SPECIES OCCURRING IN A SINGLE LOCATION.
- PLANT DIVERSITY, IS REFLECTED IN THE DIVERSITY OF THE ANIMALS, BOTH AQUATIC AND TERRESTRIAL AND THE PRESENCE OF ENDANGERED FLORA AND FAUNA

IN ADDITION TO THE RESIDENT PLANTS AND ANIMALS, MANGROVE HABITATS ARE IMPORTANT:

- FOR SHORE BIRDS THAT MIGRATE SEASONALLY FROM THE NORTHERN TO THE SOUTHERN HEMISPHERES;
- NURSERY AND SPAWNING GROUNDS FOR DEMERSAL AND PELAGIC FISH AND CRUSTACEAN SPECIES

MANGROVES IN THE SOUTH CHINA SEA

30% OF THE WORLD'S MANGROVE AREA IN SEVEN COUNTRIES

11% OF THE WORLD'S TOTAL ON MARGINS OF THE SOUTH CHINA SEA MARINE BASIN.

RATES OF LOSS HIGH: 80% OF THE MANGROVE BORDERING THE GULF OF THAILAND HAS BEEN LOST COMPARED WITH ONLY AROUND 20% ON THE ANDAMAN SEA COAST OF THAILAND.

ANNUAL RATES OF LOSS (-1.61 % PER ANNUM) IN THE SEVEN COUNTRIES, BETWEEN 1990 AND 2000, WERE GREATER THAN THE WORLD AVERAGE (-1.04 % PER ANNUM)

THE TOTAL AREA LOST IN THE SEVEN COUNTRIES ESTIMATED IN 1998 AT 4.2 MILLION HA i.e. TWO THIRDS OF THE MANGROVE LOST DURING THE TWENTIETH CENTURY.

WHAT REMAINS IS APPROXIMATELY 1.8 MILLION HECTARES

THE CAUSES OF MANGROVE DESTRUCTION 1990 – 2000

- CONVERSION TO POND AQUACULTURE, PARTICULARLY SHRIMP,
- CLEAR FELLING OF TIMBER FOR WOODCHIP PRODUCTION,
- CLEARANCE FOR URBANISATION AND PORT DEVELOPMENT; AND
- HARVEST OF TIMBER PRODUCTS FOR SUBSISTENCE AND DOMESTIC USE

CURRENT REGIONAL THREATS TO MANGROVE SYSTEMS BORDERING THE SOUTH CHINA SEA

Anthropogenic Threats

1. Reclamation and infrastructure development (all countries)
2. Pollution from shrimp farming (China, Indonesia, Thailand)
3. Conversion to industrial parks, ports and harbours (China);
4. Charcoal production (Indonesia, Philippines and Cambodia)
5. Conversion-to shrimp culture potential long-term threat (Viet Nam)

Natural Threats

1. Sea level rise
2. Episodic events – tsunami, typhoon.

Transboundary Influences

1. Regional trade – Charcoal, wood chips
2. Global trade – Shrimp

CHALLENGES FOR SUSTAINABLE MANGROVE USE

- Lack of sustainable financing, China, Cambodia, Philippines, and Indonesia less so in Thailand and Viet Nam;
- Poverty of coastal communities in all countries;
- Weak or non-existent law enforcement, in all countries
- Ineffective management systems and land-use planning (Viet Nam and Indonesia)
- Lack of experience and techniques for multi-species replanting (in all countries);
- Lack of long-term regional and international co-ordination and co-operation; and,
- Lack of understanding on the part of the general public and decision makers regarding the functions and values of mangrove ecosystems.

VALUES OF MANGROVE GOODS AND SERVICES

DIRECT USE VALUES:

- Extractive use of resources such as timber, construction materials, fish, shrimps
- Non-extractive uses, tourism, teaching, research

NON-USE VALUES

- Spawning & nursery areas for off-shore demersal and pelagic species
- Option values, aesthetic values
- Coastal protection, carbon sequestration

TOTAL US DOLLAR VALUE VERY SUBSTANTIAL COMPARED WITH VALUES ASSIGNED IN THE 1970'S WHEN MANGROVES WERE CONSIDERED NON-PRODUCTIVE LAND ONLY USEFUL FOR RECLAMATION

CURRENT PERCEPTIONS REGARDING MANGROVES

THAILAND RECOGNISED PROBLEMS RESULTING FROM MANGROVE LOSS IN THE 1990'S SUCH THAT BY 2002 THE TOTAL AREA OF MANGROVE IN THAILAND HAD STABILISED.

POST TSUNAMI RECOGNITION BY MOST COUNTRIES OF THE VALUE OF MANGROVES FOR COASTAL PROTECTION.

PLANTING/RESTORATION OF MANGROVES HAS TO DATE FOCUSSED ON SINGLE SPECIES USUALLY *RHIZOPHORA* MONOCULTURE

CURRENT NEEDS IN MANGROVE MANAGEMENT

- POLITICALLY ACCEPTABLE AND SCIENTIFICALLY SOUND ECONOMIC VALUATIONS OF MANGROVE GOODS AND SERVICES THAT:
  - PERMIT ACCURATE, OBJECTIVE CONSIDERATION OF CURRENT VALUES OF MANGROVE GOODS AND SERVICES IN DEVELOPMENT PLANNING AND DECISION MAKING
- GREATER SCIENTIFIC UNDERSTANDING OF THE RESILIENCE OF MANGROVES WITH RESPECT TO ALTERNATIVE FORMS OF DIRECT, EXTRACTIVE USE
- MODELS OF SUCCESSFUL MANAGEMENT FOR SUSTAINABLE USE

CURRENT NEEDS IN MANGROVE RESTORATION

- A PARAMOUNT CONSIDERATION IS THE NEED TO DIVERSIFY THE RANGE OF SPECIES USED IN REPLANTING/RESTORATION WITH A CONSEQUENT GREATER UNDERSTANDING OF:
  - THE SITE SPECIFIC LIMITS TO SPECIES DISTRIBUTIONS IN RESPONSE TO ABIOTIC ENVIRONMENTAL FACTORS.
- HANDBOOKS OF REPLANTING TECHNIQUES AND SIMPLE GUIDES TO IDENTIFICATION OF APPROPRIATE ENVIRONMENTAL CONDITIONS FOR DIFFERENT SPECIES
- NATIONAL PROGRAMMES THAT FOSTER MULTI-SPECIES REFORESTATION BY PROVIDING CONCRETE INCENTIVES

A FAILURE TO ADOPT A REGIONAL MULTI-SPECIES APPROACH TO MANGROVE REFORESTATION WILL RESULT IN GRADUAL LOSS AND DEGRADATION OF MANGROVE BIOLOGICAL DIVERSITY IN THE SOUTH CHINA SEA MARINE BASIN

SINCE THE MANGROVES OF THE SOUTH CHINA SEA ARE THE MOST DIVERSE IN THE WORLD THIS REPRESENTS A SIGNIFICANT LOSS OF GLOBAL BIOLOGICAL DIVERSITY