International Workshop on Tidal Area Features and Natural Processes
February 24-26, 2009, Taipei, Taiwan

ICID Handbook
“Sustainable development of tidal areas”
Chapter 1 & 7

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Outline of presentation

- ICID Working Group SDTA
- Handbook SDTA: outline & scope
- Chapter 1 Introduction, including Position paper
- Chapter 7 Integrated decision support framework
- Next steps
Objectives of the ICID WG-SDTA

- To collect information about the natural environment in tidal areas around the world
- To identify sustainable development and conservation options in the tidal areas
- To find a balance between the preservation and development of tidal areas.
Definition of coastal zone

All those coastal areas where the tidal processes are capable of affecting man’s activity or of being influenced by man.

This roughly extends tidal areas between the following limits:

- on the seaward side up to the limit of conventional construction or dredging activity (typically of the order of 30m water depth) and
- on the landward side up to the limit of the action of the sea, including all those areas that might be subject to flooding by seawater and up all estuaries and rivers to the tidal limit.

Tidal areas differ greatly depending on their location, geo-physical conditions, climate, tidal range and cultural differences.
Coastal zone

3% of the earth surface, 60% of the population

Member countries Working Group SDTA
Member countries Working Group SDTA

- China
- Chinese Tapei
- Germany
- India
- Indonesia
- Japan
- Korea
- Malaysia
- The Netherlands
- United Kingdom
Sustainable development of tidal areas provides appropriate social and economic development and productivity of tidal areas, whilst caring for and working with the natural environment, in a way that is fair and affordable both now and in the future.

Vision is based on:

- Convention of RAMSAR
- Dublin Principles
- Principles of IWRM
- Principles of ICZM
Handbook – outline & scope

- To draw together existing knowledge and experience and the results of recent and current research to produce detailed procedural guidance on sustainable development of tidal areas.
- To provide an overview of current best practices for use by professionals working in the planning, design, construction and operation and management of flood control and land & water management in tidal areas.
Handbook - structure

- Synthesis based on:
- Case studies of historically significantly monumental tidal reclamation projects from member countries, in particular China, Chinese Taipei, Germany, India, Indonesia, Japan, Korea, Malaysia, the Netherlands and UK

Case studies will be available on CD-Rom
1. Introduction
2. Managing the development of tidal areas
3. Features of tidal lowlands
4. Natural processing in tidal lowlands
5. Engineering aspects for a sustainable development of tidal lowlands
6. Tidal reclamation and their impacts on natural processes
7. An integrated decision support framework
Chapter 1

1.1 ICID Working Group SDTA
1.2 Historical context
1.3 Towards sustainable development of tidal areas
1.4 Objectives, readership and structure of the manual
Principles

1. Integrated multi-functional approaches
2. Holistic engagement with social, economic and environmental issues
3. Management of risk and uncertainty and adaptation to change
4. Enabling methods and means
Principle 1 – Integrated multi-functional approaches

Issue 1.1: Integrated land management

Issue 1.2: Integrated water management
Principle 2 – Holistic engagement with social, economic and environmental issues

Issue 2.1: Engagement with all stakeholders

Issue 2.2: Management of resources and promotion of sustainable production

Issue 2.3: Environmental enhancement and stewardship of natural resources
Principle 3 – Management of risk and uncertainty and adaptation to change

Issue 3.1  Risk management to protect people, property and the environment from natural and man-made hazards

Issue 3.2: Adaptive management to take account of climate change, population growth and other long-term changes and uncertainties
Principle 4 - Enabling methods and means

Issue 4.1  Appraisal using methods that are rigorous, coherent and transparent and consider social, environmental and economic costs and benefits

Issue 4.2  Knowledge, skills and awareness to promote sustainable approaches
DEVELOPMENT OF TIDAL AREAS: SOME PRINCIPLES AND ISSUES TOWARDS SUSTAINABILITY†

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ABSTRACT

The coastal zone comprises only 3% of the earth’s surface, but contains a disproportionately high amount of its assets. Tidal areas include all those coastal areas where the tidal processes are capable of affecting man’s activity or of being influenced by man. Tidal areas differ greatly depending on their location, geophysical conditions, climate, tidal range and cultural differences. Throughout the world, tidal areas have been and are being developed. These developments will continue as food production will need to be doubled in the next 25 years. To address questions related to a sustainable development of tidal areas, the International Commission of Irrigation and Drainage (ICID) established the Working Group on Sustainable Development of Tidal Areas in 2001. The working group has studied these questions and formulated principles and issues for sustainable development of tidal areas based on the relevant international conventions. The aim of this paper is to represent the official position of ICID and to support the preparation of the ICID Handbook Towards Sustainable Development of Tidal Area: Some Principles and Experiences. Copyright © 2009 John Wiley & Sons, Ltd.

Key words: tidal areas; sustainable development; integrated land and water management

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Chapter 7 - Integrated decision support framework

7.1 Integrated multi-functional approaches
7.2 Holistic engagement with social, economic and environmental issues
7.3 Management of risk and uncertainty and adaptation to change
7.4 Enabling methods and means
7.1 Integrated multi-functional approaches

Vision is based on:
- Convention of RAMSAR
- Dublin Principles
- Principles of IWRM
- Principles of ICZM
### 7.2 Holistic engagement with social, economic and environmental issues

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Degrees of citizen power (or participation)</th>
<th>Levels of non-participation “contrived to substitute for genuine participation”</th>
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<tbody>
<tr>
<td>Low</td>
<td>Manipulation</td>
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<td>Therapy</td>
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<td>Informing</td>
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<td>Consultation</td>
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<td>Placation</td>
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<td></td>
<td>Partnership</td>
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<td></td>
<td>Delegated power</td>
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<tr>
<td></td>
<td>Citizen control (or self-governance)</td>
<td>Degrees of tokenism (or symbolic participation)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Government responsibility</td>
<td>Individuals encouraged to DIY</td>
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<tr>
<td></td>
<td>Governments abrogate responsibility</td>
<td>Community takes major responsibility</td>
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<td></td>
<td>Governments devolve responsibility</td>
<td>Significant community involvement</td>
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<td></td>
<td>Governments take reduced responsibility</td>
<td>Minimal community involvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Governments take major responsibility</td>
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Finding a balance between Government responsibility and community participation
7.3 Management of risk and uncertainty and adaptation to change

1a. Drivers
- Climate change
  - Impacts on:
    - rainfall
    - soil moisture
    - rising sea levels
    - storm surge

1b. State
- Socio-economic change
  - Land use change
  - Urban development
  - Prosperity
  - Attitudes towards risk

  - Age of infrastructure
  - Performance of flood defences, sewerage systems and coastal protection systems

2. Source-Pathway-Receptor model of risk

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<thead>
<tr>
<th>Sources</th>
<th>Pathways</th>
<th>Receptors</th>
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<tbody>
<tr>
<td>- Regional rainfall (groundwater)</td>
<td>- Fields</td>
<td>- People</td>
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<tr>
<td>- Catchment rainfall (river flows)</td>
<td>- Drains</td>
<td>- Property</td>
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<tr>
<td>- Point rainfall</td>
<td>- Channels</td>
<td>- Industry</td>
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<tr>
<td>- Storm surges</td>
<td>- Upstream storage</td>
<td>- Infrastructure</td>
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<td>- Flood defences</td>
<td>- Ecosystems</td>
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<td>floodplains</td>
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3. Responses
(a) Managing risk
- Risk model: Risk = probability \times consequence
- Measures are required to reduce the probability and/or consequences

(b) Risk assessment and appraisal of measures considers:
- economic
- social and
- environmental factors
7.4 Enabling methods and means

Express results in a ‘simple’ way

Strategic planning for capacity development
Next steps

Where are we now?

Draft versions of chapters are discussed during this workshop

- Review of chapters
- Final drafts of Chapters
- Presentation of handbook: when & where?
Thank you for your attention