Inventory, assessment and monitoring of wetlands: An integrated approach

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Background

Forms an essential tool for the conservation and wise use of wetlands, as well as to their use through management planning processes to maintain and enhance the ecological quality

Guidelines have been laid to assist Contracting Parties and others in implementing the key Ramsar Convention processes Contracting Parties called in several COP8 Resolutions for the Scientific and Technical Review Panel (STRP) to prepare further guidance on different aspects of wetland inventory and assessment in order to fill gaps in the current toolkit -

These include:

The *Ecological 'outcome-oriented' indicators for assessing the implementation effectiveness of the Ramsar Convention* Resolution IX.1 Annex D)

Guidelines for the rapid assessment of inland, coastal and marine wetland biodiversity (Resolution IX.1Annex E i.)

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It is stressed to undertake and report on assessment of the status and trends in the ecological character of Ramsar sites, within the wider context of the status and trends of inland, coastal and marine wetlands, including through the work of the *Millennium Ecosystem Assessment* (MA) and through contributing to the work of the *Convention on Biological Diversity* (CBD) in developing and reporting on indicators of the status and trends for inland waters and coastal and marine biodiversity (*Resolutions VIII.7* and *VIII.8*)

At COP8 the Convention's guidance in the form of an integrated framework for wetland inventory, assessment and monitoring were requested to be consolidated to focus on the purposes of and interrelationships among the different aspects and to provide summary information on each aspect of the relevant guidance adopted by the Convention. This also included additional aspects of guidance requested by *Resolution VIII.7*

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This integrated framework provides a rationale for applying the mechanisms of the Convention for inventory, assessment and monitoring in order to increase public and political awareness and understanding of the critical values and functions of wetlands in supporting sustainable development and human well-being

The related *Resolution VIII.7* request for harmonization of definitions and terms throughout the suite of Ramsar guidance on inventory, assessment, monitoring and management of the ecological character of wetlands, which is addressed by the *Resolution IX.1* Annex A as part of the "Conceptual Framework for the wise use of wetlands and the maintenance of their ecological character"

The delivery of the conservation and wise use of wetlands embodies

Establishing the location and ecological characteristics of wetlands (baseline inventory),

Assessing the status, trends and threats to wetlands (assessment),

Monitoring the status and trends, including the identification of reductions in existing threats and the appearance of new threats (monitoring); and

Taking actions (both *in situ* and *ex situ*) to redress any such changes causing or likely to cause damaging change in ecological character (management)

The importance of identifying, assessing and reporting the status of Ramsar sites and other wetlands in the implementation of the Convention

Site scale: the Convention's guidance on management planning stresses that establishing the ecological character features of a site, and the factors that are positively or adversely affecting or likely to affect this character, is essential to the implementation of an effective management planning process - *Resolution VIII.14*

Regional and Global scales: understanding of the status and trends of wetland ecosystems has been recognized as an essential basis for the establishment of national and international policies, strategies and priorities for actions

Monitoring and reporting the conservation status of designated Ramsar sites and other wetlands provide an indication of the success of the Ramsar Convention as an international treaty and its mechanisms for achieving wetland conservation and wise use - *Resolution VII.11* (Objective 4.1 of the Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance)

Studies on the distribution, status and trends of wetland ecosystems have shown substantial gaps in available information

The Global Review of Wetland Resources and Priorities for Wetland Inventory [GRoWI - 1999] : only 7% of countries had adequate national wetland inventory and 25% of countries had no available national wetland inventory

Parties' National Reports to COP8 indicated that although this situation had somewhat improved – 28 Parties indicated that they have comprehensive wetland inventory with national coverage (24%) and a further 51 that they had partial inventories

The MA's synthesis report for the Ramsar Convention (Ecosystems and Human Well-being: Wetlands and Water. Synthesis 2005) concluded that there is insufficient information on the extent of all wetland types such as inland wetlands that are seasonally or intermittently flooded and some coastal wetlands to document the extent of wetland loss globally. On available evidence, past losses and present rates of loss and decline of inland and coastal wetland ecosystems and their wetland dependent species are greater than those in marine and terrestrial ecosystems

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By 2002, management plans including monitoring programmes, designated for Ramsar sites were in only 24 Contracting Parties (20%) while the use of the Ramsar sites network as a national and international network for monitoring the status and trends of wetland ecosystems had not yet been established - *Resolution VII.11*

There exists a need to ensure more comprehensive collection and reporting of such information essential for determining future policies and for designating Ramsar sites

A number of inventory and assessment initiatives have recently been developed or are ongoing to support the Convention in implementation of different aspects of this integrated framework –

Mediterranean Wetlands Initiative (MedWet) Inventory methodology - European Union-funded SUDOE and CODDE projects

Development of the Asian Wetland Inventory methodology - Multiple purpose and multi-scalar approach

First phase of Pan-European wetland Inventory project - Wetlands International and RIZA (Netherlands)

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Preparation through the STRP of a wetland inventory meta-database model for creation of a standardised record of information about each wetland inventory - being developed within the Ramsar Sites Information Service by Wetlands International (*Resolution VIII.6*)

European Space Agency's TESEO and GlobWetland projects - developing demonstration products based on earth observation (remote sensing) to improve the ability of wetland managers to better monitor and assess the condition of wetlands within their respective countries

Methodologies and results of the Millennium Ecosystem Assessment (MA) – Focus on assessment of ecosystem services and human well-being

The CGIAR Comprehensive Assessment of Water and Agriculture, led by the International Water Management Institute (IWMI), Sri Lanka - Special report on wetlands, water and agriculture for the Ramsar Convention, based on a series of questions developed by the STRP

The relationship between inventory, assessment and monitoring for wetland management - *Resolution VIII.6*

These are linked elements and form important and interactive data gathering exercises

When implemented together, they provide the information needed for establishing strategies, policies and management interventions to maintain the defined wetland ecosystem character and hence ecosystem benefits/services

Data and information collected through inventory, assessment and monitoring are essential parts of an overall wetland management planning process, at various scales. The management planning process provides the mechanisms for maintenance of the ecological character of the wetlands

Inventory is useful for collecting information to describe the ecological character of wetlands that provides the basis for guiding the development of appropriate assessment and monitoring

Assessment considers the pressures and associated risks of adverse change in ecological character

Monitoring includes both survey and surveillance, provides information on the extent of any change in ecological character

Multi-scalar approaches to wetland inventory, assessment and monitoring

Can be undertaken at discrete spatial scales using (different) appropriate techniques for each

Data should be aggregated to avoid constrains by the scale and availability of information - this is possible when subsequent analyses draw on data from larger scales

Wetland inventory method has been carried out at different spatial scales respective to their purpose:

Global – purpose: presence/absence of wetlands in continents and islands

Continental – purpose: distribution of regions dominated by wetlands within continents or islands

Regional – purpose: range of specific wetland types

Local – purpose: characteristics of individual wetlands

Site – purpose: variability within individual wetlands

Mediterranean Wetland Inventory
Asian Wetland Inventory (AWI)

Based on multi-scalar approaches and are recognized by the Ramsar Convention as appropriate for application for a variety of purposes

The Asian Wetland Inventory : answer to multiple needs

Takes into account the requirement for information at multiple scales (local to global) and includes the need to:

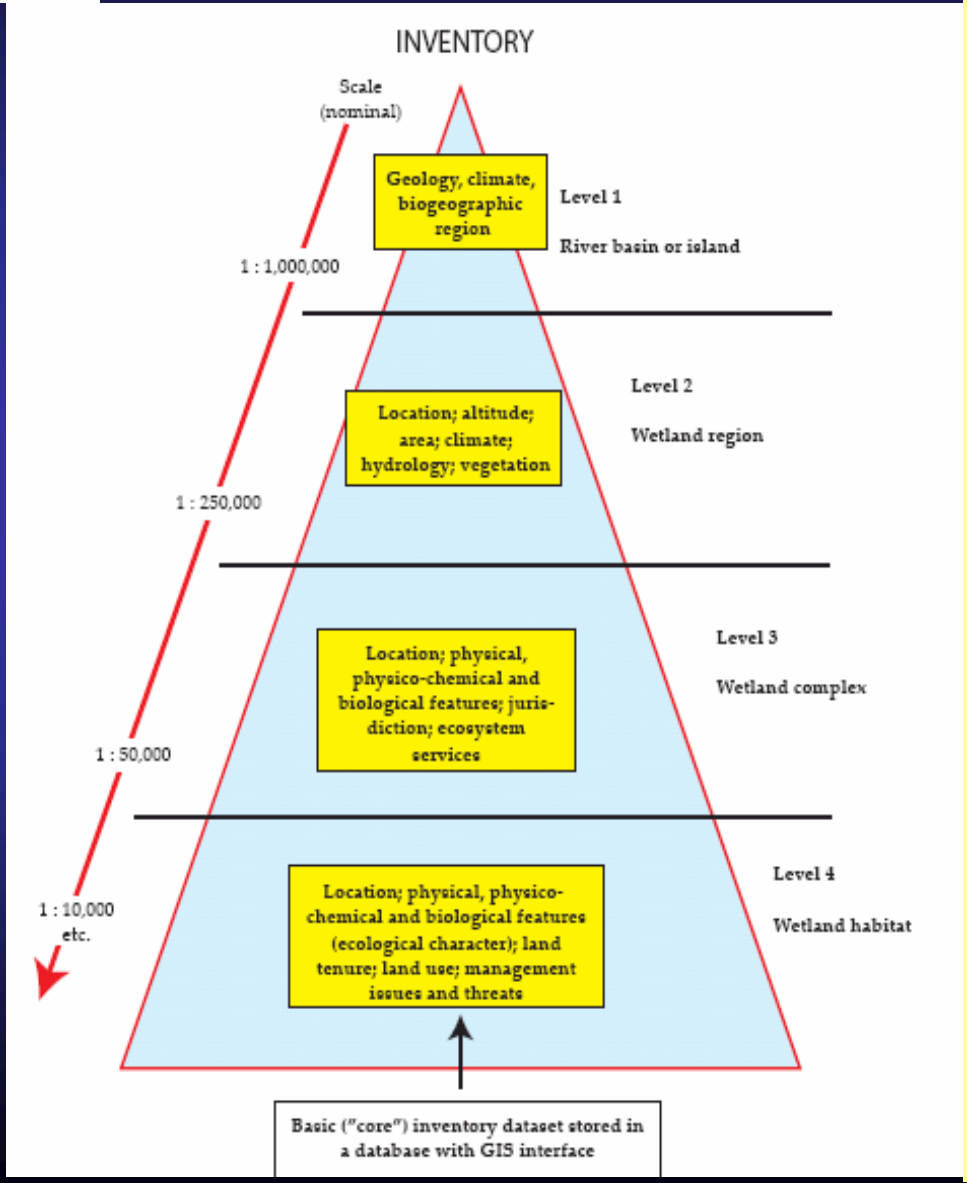
* Develop standardised field data collection sheets
* Provide core data/information on wetlands to support international conventions and treaties on wetlands, climate change, biodiversity, migratory species and desertification, and their implementation by governments

To achieve:

* Analyse long-term trends in wetlands and their natural resources
* Enable regular revisions and updates of information on wetlands of national and international importance
* Disseminate these analyses for wider consideration and use in sustainable development and conservation of wetland resources

Similar multi-scalar procedures can be developed for wetland assessment and monitoring based on multi-scalar information collected under the inventory process and could provide managers and others with analyses suitable for the scale of investigation.

A schematic representation of the hierarchical approach to wetland inventory



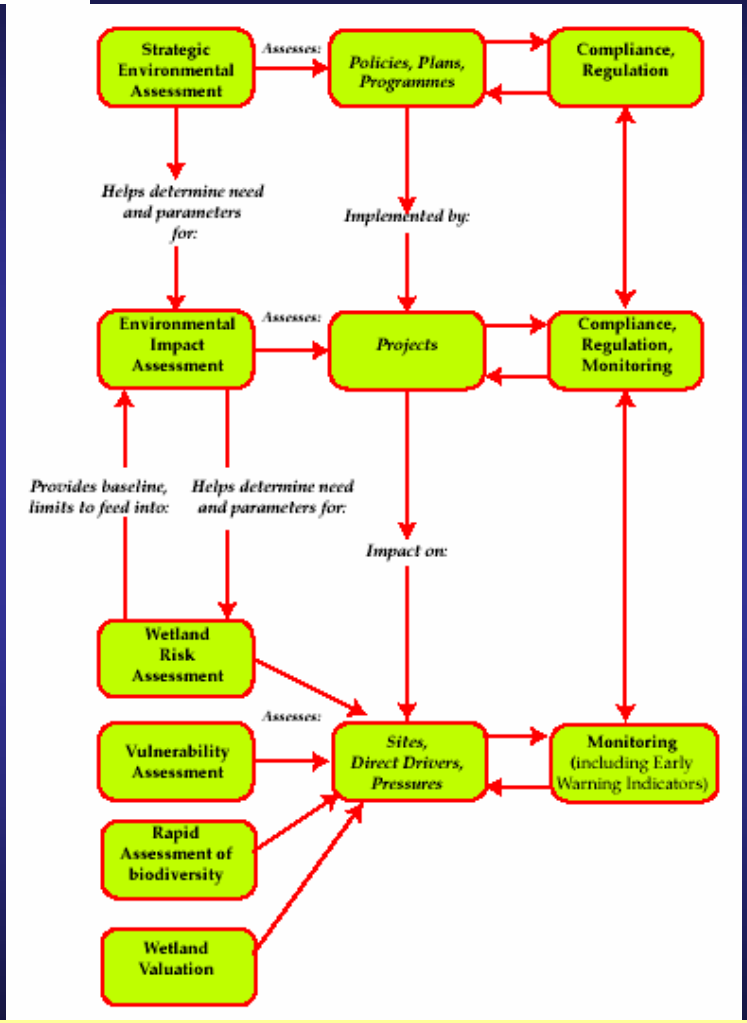
Level 1 - involves delineation of geographical regions (major river basins and islands) in Asia and encompasses a description of the geology, climate and ecology of each based on existing information sources.

Level 2 - analysis concerns delineation of wetland regions within each geographic region. This is done on the basis of similar climatic, geologic, hydrologic and vegetation features.

Level 3 - analysis undertakes grouping and description of wetland complexes within each region on the basis of more detailed information.

Level 4 - analysis makes detailed descriptions of individual wetland habitats.

Relationships among different wetland assessment tools available through the Convention



Strategic Environmental Assessment (SEA) – focuses on key issues, priority risks and opportunities relevant to project-specific Environmental Impact Assessments (EIA).

Environmental Impact Assessment - help determine the need for and the parameters of Vulnerability and Risk Assessments and Wetland Valuations.

Vulnerability and Risk Assessments - help define baselines, tolerance limits and other elements to feed in to EIA as well as potential measures for reducing the risk of wetland.

Risk Assessment - can also quantify the magnitude and likelihood of impacts, as part of an EIA.

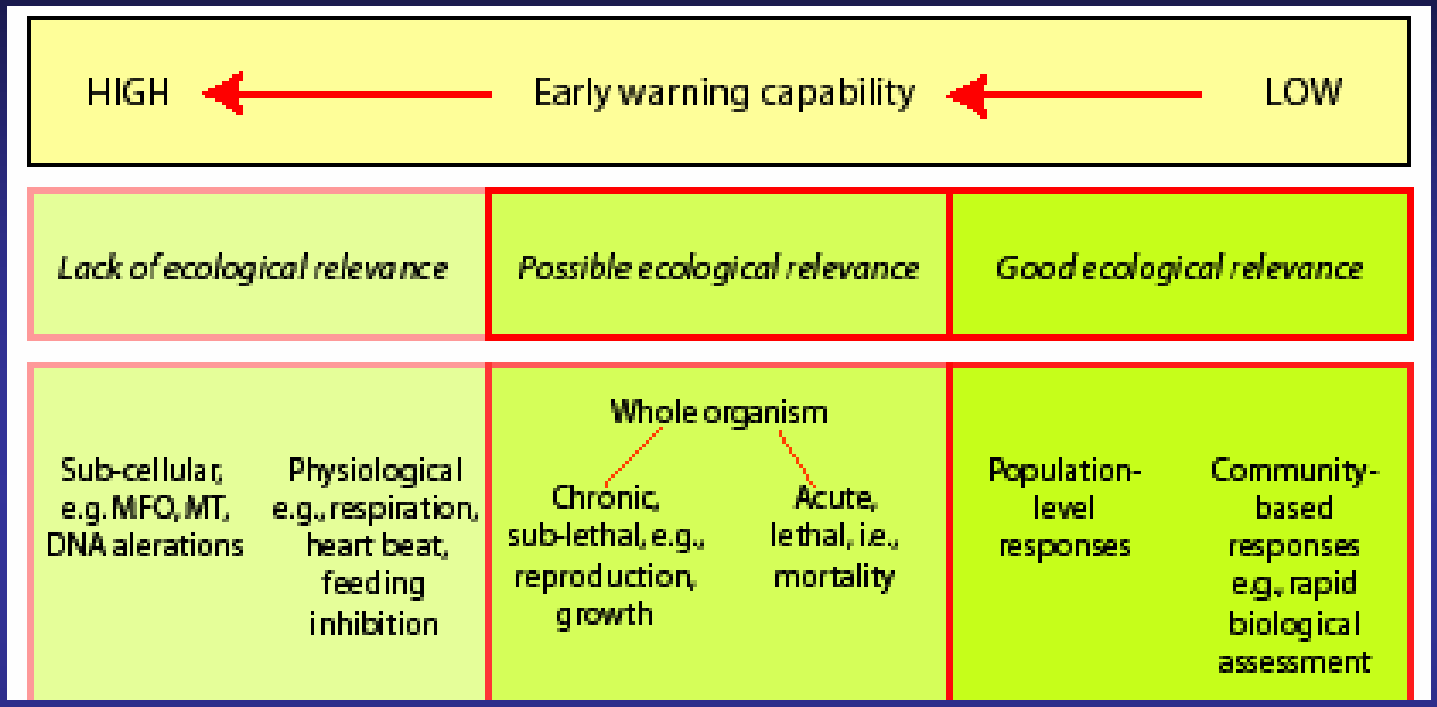
Wetland Valuation - information to assist in articulating the benefits obtained from a wetland and hence support the concepts provided in Vulnerability and Risk Assessments.

Information on impacts collected in the EIA process and through subsequent monitoring activities can feed into the SEA process, as well as informing Vulnerability and Risk Assessments and Wetland Valuations.

Rapid Assessment of biodiversity provides information that can guide EIA and support Vulnerability and Risk Assessment, and identify elements of biodiversity that could be used within Wetland Valuation.

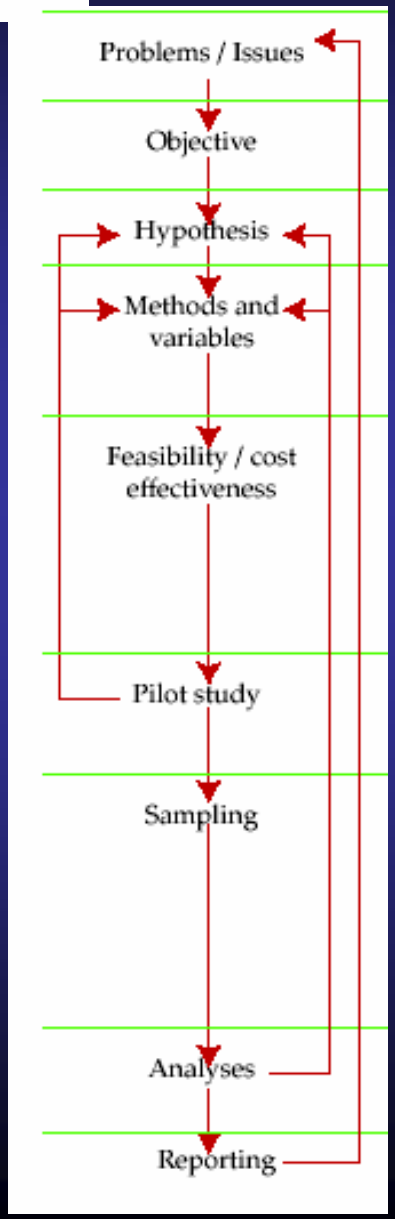
Strategic Environmental Assessment, Environmental Impact Assessment, Vulnerability and Risk Assessment help define the scope of monitoring for policies/plans/programmes, for projects and for site management, respectively.

Wetland risk assessment framework: the relationship between ecological relevance and early warning capability to measure biological responses



1. Wetland Risk Assessment Framework - *Resolution VII.10* : addresses early warning indicators and measurement of these indicators draw on data from site management & monitoring and feed back to adjustments in that management.
2. Rapid Assessment of biodiversity can provide early warning of impending change, but there exists an inverse relationship between the extent of the ecological relevance of an indicator and the extent of early warning.
3. Early warning indicators can provide data to the monitoring stimulated in relation to projects by Environmental Impact Assessment.

Applying wetland inventory, assessment and monitoring tools in the context of the wise use of wetlands



Framework consists of series of steps and was adopted by COP6 in 1996 - *Resolution VI.1.*

Millennium Ecosystem Assessment's Conceptual Framework for Ecosystems and Human Wellbeing – multiscalar approach which indicates how and where policy and management interventions, including the different components of the Convention's toolkit can be made use of (*Resolution IX.1 Annex A*.)

Within this conceptual framework, most of the Convention's tools for inventory, assessment and monitoring concern the maintenance of the ecological character of wetlands through interventions within wetland ecosystems themselves – between the components and processes of wetlands and the ecosystem benefits/services these deliver.

Environmental Impact Assessment + Risk Assessment + Vulnerability Assessment = address interactions between "Direct Drivers of Change" to wetlands and the wetlands themselves.

Strategic Environmental Assessment = acts as an intervention between Indirect and Direct Drivers of Change concerning with policies, plans and programmes.

Bridging the gaps: Priorities for improving integrated wetland inventory, assessment and monitoring

Countries that have not yet conducted a national wetland inventory should do so on a priority basis, using an approach that is comparable with other large-scale wetland inventories already underway or complete.

Such studies should focus on a basic data set that describes the location and size of the wetland and the major biophysical features, including variation in the areas and the water regime (*Resolution VIII.6*).

Management-oriented information on wetland threats & uses, land tenure & management regimes, benefits & values should be acquired and adequately stored.

Inventory and assessment programs should be clearly defined explaining the range of information that has been collated or collected.

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The effectiveness of all aspects of wetland inventory and assessment should be increased through the use of a standardised framework and a generic wetland inventory core dataset (*Resolution VIII.6*), designed to be as flexible as possible for use in all regions of the world and to accommodate various inventory and assessment objectives.

Priority should be given to improving the global inventory for wetland habitats that are currently poorly covered in most parts of the world, these include:

Seagrasses

Coral reefs

Saltmarshes & Coastal tidal flats

Mangroves

Arid-zone wetlands

Rivers & streams, and

Artificial wetlands

Wetland monitoring systems should build upon the information provided in wetland inventory and assessment activities. Specific monitoring should be based on a hypothesis derived from the assessment data and be contained within a suitable management structure.

Using appropriate remote sensing and ground techniques, models for effective wetland inventory, assessment & monitoring should be compiled and widely disseminated.

Thank You!