10th Meeting of the Conference of the Parties to the Convention on Wetlands (Ramsar, Iran, 1971)

"Healthy wetlands, healthy people"

Changwon, Republic of Korea,
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Additional information on integrating the conservation and wise use of wetlands into river basin management

1. During the preparation of the draft Resolution on consolidated guidance for integrating wetland conservation and management into river basin management (COP10 DR 19), a number of specific topics were identified where additional information could be provided to supplement the consolidated guidance text, should this be adopted at COP10, in a volume based on the guidance in the next edition of the *Handbooks for the Wise Use of Wetlands*.

2. The analysis and reporting of a range of case studies on the integration of wetland conservation and management into river basin management were undertaken as part of the the current work programme of the Scientific and Technical Review Panel (STRP). These case studies will be reported in detail in the draft Ramsar Technical Report currently in preparation, and they will also be used to prepare additional case study and information boxes for the new Handbook on this subject.

3. The STRP working group responsible for the tasks related to river basin management decided that it might be helpful to the Contracting Parties to have this additional information available in advance, as far as possible, to assist them in their deliberations on the draft Resolution now under consideration, DR 19.

4. Accordingly, this information paper contains a list of the proposed additional information boxes, with text for these boxes provided in Annex 1 where draft text is already available. For reference purposes, a list of the case studies contained in the draft Ramsar Technical Report is also provided here.

5. A number of the information boxes and case studies currently included in Wise Use Handbook 7 (3rd edition) will be retained and included in the proposed new Handbook on river basin management.

1. Proposed information boxes, in order of placement in the main text of the river basin management guidance (DR 19)

Information Box 1: Some generally accepted definitions/descriptions of IWRM and IRBM
Information Box 2: Challenges associated with integrating wetlands into river basin management
Information Box 3: The "Critical Path" concept

Information Box 4: Why is the national preparatory phase important?
Information Box 5: Water pricing and economic instruments in water resources management
Information Box 6: Use of the terms "river basin management institutions" and "river basin management agencies"
Information Box 7: What is CEPA in river basin management?
Information Box 8: Cross-sectoral collaboration and participation in river basin management
Information Box 9: Payment for Ecosystem Services in Watersheds
Information Box 10: CEPA in the river basin management cycle
Information Box 11: Techniques for functional assessment of wetlands
Information Box 12: Spatial planning approaches to facilitate the integration of wetlands into river basin management
Information Box 13: Impacts of land use and water development projects
Information Box 14: Involving local communities in monitoring wetlands within river basins
Information Box 15: Further reading and sources of additional guidance on integrated river basin management.
Optional Information Box: Key messages from the MA Wetlands Synthesis.

2. Case studies of integration of wetlands into river basin management

The following case studies were analysed and will be documented in the draft Ramsar Technical Report (in prep.) on wetlands and river basin management. The cases have provided a wide range of source material for information boxes to be included in a future new Handbook based on the consolidated guidance on river basin management.

Cases reported in detail in the draft Ramsar Technical Report

- Great Ruaha – Tanzania
- Cross-sectoral policy objectives for conservation of wetland biodiversity – South Africa
- Lake Malawi-Niassa – Malawi, Mozambique, Tanzania
- Okavango River Basin – Angola, Botswana, Namibia
- Thukela Water Project – South Africa
- Deschutes Basin – USA
- Grand River – Canada
- Quito catchment – Ecuador
- Lake Chilika – India
- Yangtze River – China
- Scotland River Basin – UK
- Tisza River – Europe
- Upper Guadiana Basin - Spain

Case abstracts included in the draft Ramsar Technical Report

- Eman – Sweden
- Hunter-Central Rivers – Australia
- La Miel – Colombia
- Loire River Basin – France

- Lonjsko Polje National Park – Croatia
- Lower Songkhram – Thailand
- Pang River – UK
- Rattlesnake Creek – USA
- Savanna River – USA

3. Text for information boxes

Note that references highlighted in yellow will be updated following the publication of the Ramsar Technical Report on case studies of integrating wetlands into river basin management.

Information box 1: Some definitions/descriptions of IWRM and IRBM in general use

World Bank definition of IWRM:
An integrated water resources perspective ensures that social, economic, environmental and technical dimensions are taken into account in the management and development of water resources. Source: http://web.worldbank.org/

CAPNet definition of IWRM:
Integrated water resources management is a systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives. Source: CAPNet Tutorial on Integrated Water Resources Management http://www.archive.cap-net.org/iwrm_tutorial/p_2_1.htm

GWP definition of IWRM:
IWRM may be defined as: a process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Source: Integrated Water Resources Management - GWP Technical Committee (TEC) Background Paper No. 4. cited in http://www.gwpforum.org/gwp/library/TEC10.pdf

WWF definition of IRBM (adapted from Global Water Partnership definition of IWRM):
Integrated river basin management (IRBM) is the process of coordinating conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximise the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems. Source: http://www.panda.org/about_wwf/what_we_do/freshwater/our_solutions/rivers/irbm/index.cfm

World Water Forum description of IWRM
IWRM [was] depicted as an incremental and adaptive policy approach that seeks the coordinated development and management of water, land and related resources. Source: 4th World Water Forum Synthesis Report http://www.worldwatercouncil.org/fileadmin/wwc/World_Water_Forum/WWF4/synthesis_sept06.pdf

End Information Box 1

Information Box 2: Challenges associated with integrating wetlands into river basin management

Whilst several countries have achieved good results in integrating wetland management and water resources management at the local, site or sub-basin level, successful upscaling of these approaches to the basin level has generally proved difficult, although not impossible. Experiences based on a range of recent case studies, including those in the [forthcoming] Ramsar Technical Report on RBM case studies have provided some useful lessons and insights into the generic challenges of upscaling and implementing river basin management approaches into which wetlands are integrated.

Difficulties in implementation of wetland management plans often occur when higher-level water resources planning, management and water allocation issues have not been adequately addressed prior to the design and implementation of wetland management plans. Conversely, some problems in river basin management, such as deteriorating water quality or changes in flooding patterns, can have their origins in failure to adequately address the importance of wetland ecosystems in the early stages of river basin planning.

Obstacles to upscaling (i.e., from local to river basin level) can arise from insufficient attention to:

- provision of an enabling policy, legislative and institutional environment at national and river basin levels, and
- establishment and promotion of mechanisms for cross-sectoral and multi-stakeholder dialogue, decision-making, and setting of policy objectives.

Obstacles to implementation of management plans can arise from:

- insufficient attention to sequencing the river basin management activities described in Resolution VII.18 (1999).

Obstacles to both upscaling and implementation of wetland or river basin management plans can arise from:

- weaknesses in multi-stakeholder processes of consultation, consensus-seeking and decision-making. Such weaknesses generally arise when communication, education, participation and awareness (CEPA) programmes are not properly designed into river basin management planning and ongoing implementation, or are not adequately supported by funding and technical resources.

At river basin level, some challenges are related to operational issues such as local zoning, water allocations, and land use practices. Planning and management need to be flexible, with implementation mechanisms that allow responsible sectoral agencies to respond to local river basin priorities while remaining consistent with national policy and planning frameworks.

It is also important to ensure that connections between national and river basin levels can operate in both directions. In some cases, national level policy, legislation, regulation and institutions are needed in order for river basin management initiatives to begin and to proceed at basin level. In other cases, plans and decisions made at basin level may need policy or regulatory

responses at national level to support implementation, for example declaration of certain wetlands as national or international protected areas in order to protect these wetlands and their services for the river basin.

Individual land and water users as well as communities may be reluctant to participate in implementation of management plans if they have not previously participated in the development of these plans and had some say in the setting of objectives for the river basin or the wetlands. At sectoral level, insufficient communication between various responsible agencies and institutions, allied with weak bureaucratic processes for cross-sectoral cooperation, can lead to conflicting sectoral policies at river basin level and at national level, again creating obstacles to implementation of river basin management plans and wetland management plans.

Source: draft Ramsar Technical Report on RBM case studies

End Information Box 2

Information Box 3: The "Critical Path" concept

The general "Critical Path" sequence was not a brand new idea: it evolved rather implicitly from observing and listening to the experiences of people and groups around the world in implementing integrated river basin management, integrated water resources management, and management of wetlands. From those experiences, an emerging common thread was that the sequence of various river basin management activities can be almost as important as the activities themselves.

Source: Resolution IX.1 C(i) and Handbook 7

End Information Box 3

Information Box 4: Why is the national preparatory phase important?

In many cases, including some of those described in the draft Ramsar Technical Report on case studies of river basin management, specific projects may have been initiated to address localised problems associated with water or wetlands through participatory, integrated processes. These projects may have commenced in the absence of existing national policy to support integrated river basin management. Sometimes, once the initial localised problem has been addressed, these initiatives continue to evolve from the "bottom up" into broader and more inclusive processes, which could be considered as prototypes of integrated river basin management initiatives. However, without a supportive and enabling environment in place at the national level, many bottom-up river basin management processes do not get beyond the planning phase, since there is no formal regulatory or institutional context within which the plans can be implemented, even though there may be broad commitment to implementation from the stakeholders in the river basin itself.

For example, environmental water requirements for wetlands in the river basin can be assessed with the help of specialists, but without the ability to convert these assessments to actual water allocations that are enforceable within the existing legal framework (which may be conventional or customary), the assessed environmental water requirements are not likely to be fully implemented. In addition, there should be a public institution in place with the mandate and

authority to implement plans that may require oversight and possibly enforcement, for example of water abstraction. Also, there will be little possibility of funds and resources being available for implementation of river basin management plans if there is no national supporting programme, or no legal mechanism for raising funds for implementation within the river basin.

The national preparatory phase does not have to be completed before any initiatives can being at river basin level. Indeed this national attention to more integrated river basin approaches is often triggered as a result of successful localised initiatives or projects at sub-basin or small basin level. Equally often, however, the national attention is focused on institutional development for more integrated river basin management approaches only after serious water management problems have become evident (Cap-Net tutorial, http://www.archive.cap-net.org/iwrm_tutorial/p_20_1.htm).

Sometimes it is helpful to take a more iterative "learn-by-doing" approach and allow national policy, legislation and institutional arrangements to be developed in parallel with a phase of pilot implementation of integrated river basin management in one or two selected river basins.

Source: Information for this box contributed by Heather MacKay

End Information Box 4

Information Box 5: Water pricing and economic instruments in water resources management

To be completed for Handbook.

This box will provide a summary of recent and current trends and tools related to the use of economic instruments in water resources management, including water pricing, waste discharge charges, resource management charges, and valuation of water-related ecosystem services.

End Information Box 5

Information Box 6: Use of the terms "river basin management institutions" and "river basin management agencies"

Integrated river basin management requires institutional development at levels from international (for transboundary and shared river basins) down to highly localised. At international level, institutions may include Joint Commissions, River Basin Authorities or Boards. At local level, there may be a need for highly localised organizations responsible for everyday operations and management within a sub-area of a basin, or for highly localised fora through which stakeholders can interact with and participate in river basin management.

In this Guidance, the term "river basin management institutions" is a broad term covering the full range of institutional structures and processes that might be involved in river basin management, from international to local. When the text refers to a formally constituted public organization whose mandate covers management of a single river basin, then the more specific term "river basin management agency" is used.

Source: Information for this box contributed by Heather MacKay, STRP

End Information Box 6

Information Box 7: What is CEPA in river basin management ?

CEPA is an umbrella term that stands for Communication, Education, Participation and Public Awareness. In most international cooperation agreements CEPA is recognized as the set of social instruments that is required to build understanding, support, and participation of different stakeholders for policy issues and interventions.

The need for wetland CEPA was first recognized by the Ramsar Convention in the wise use guidelines adopted at COP4 in 1990, and the first CEPA Resolution, Resolution VI.19*, Education and public awareness*, was adopted at COP6 in 1996. Resolution VII.9, *The Convention's Outreach Programme 1999-2002: Actions to promote communication, education and public awareness to support implementation of the Convention on Wetlands (Ramsar, Iran, 1971*), adopted at COP7, fully recognized CEPA as a central element in implementing the Convention, and its annexed guidelines assisted Parties in developing a strategic approach to wetland CEPA during the triennium.
See the Ramsar Handbook 4: Wetland CEPA.

What role does CEPA play in river basin management?

- CEPA is strategic and effective when it supports policy, and should therefore be planned as an integral aspect of any project, programme or policy, preferably from the beginning.
- CEPA is a process and requires flexibility and commitment for long periods of time.
- CEPA is not just education or information provision (although these are part of it): it is about building trust and relationships, networks, which may last much longer and serve multiple purposes when other wetlands or river basin management issues arise.
- CEPA is not a panacea and never functions effectively as a standalone intervention in river basin management – it should always be planned and used in combination with other instruments, such as economic, legal or technical.

Ramsar Handbook 5 (Section II, page 9) demonstrates how both local and indigenous people and government can benefit from participatory management arrangements. Development of trust among stakeholders is essential. The Okavango case study [Ramsar Technical Report on river basin management case studies] provides good demonstration material on this, as stakeholder consultation and dialogue have been a cornerstone of the planning in the Okavango River Basin. Without it and without the proper tools, the objectives of planning and the following of the principles of accountability and ownership would have been difficult to achieve.

Further reading on CEPA and stakeholder participation:

Ramsar CEPA Planning Tool. Ramsar is currently developing new guidance on planning for CEPA interventions. This new tool should provide authorities as well as wetland site managers with support on how to develop the most effective approach for wetland CEPA. The tool will be made available on CD-ROM and on the Ramsar Web site in 2008.

CEPA Toolkit. IUCN's Commission on Education and Communication (CEC) recently developed a CEPA toolkit for the Convention on Biological Diversity. While primarily targeted at professionals charged with implementing National Biodiversity Strategy and Action Plans, the

toolkit is a dynamic resource for local adaptation and many lessons can be learned for the water and wetlands sectors as well (www.cepatoolkit.org).

IWRM Tutorial. Cap-Net is an international network for capacity building in Integrated Water Resources Management. It is made up of a partnership of autonomous international, regional and national institutions and networks committed to capacity building in the water sector. CAP-Net provides a tutorial on IWRM, freely accessible at: www.archive.cap-net.org/iwrm_tutorial/mainmenu.htm.

The Cap-Net site provides links to several other resources, such as on Change and Stakeholder participation. Just two examples:

- Electronic learning guidebook on Participatory Irrigation Management http://www.cap-net.org/captrainingmaterialsearchdetail.php?TM_ID=13>
- Gender Mainstreaming in Integrated Water Resources Management - Training of Trainers Package <http://www.cap-net.org/captrainingmaterialsearchdetail.php?TM_ID=101>

Source: Information for this box contributed by Gwen van Boven, SPAN Consultants

End Information Box 7

Information Box 8: Cross-sectoral collaboration and participation in river basin management

"If you want to do it fast, do it alone; if you want to do it well, do it together".

If the process is managed well, participation can bring benefits to all involved parties, both government and non-government, at international level or among local interest groups. Whichever extent of participation is chosen, some guidelines apply that will help streamline the process as effectively and efficiently as possible.

Be pro-active. Often, project design does not include details about which people or institutions will be involved, at what stages, or what their roles and responsibilities will be. However, in every RBM context, which should by nature be integral and cross-sectoral, any project or policy will benefit from a careful planning of the participatory process, so that it will optimally support the key moments in that project or policy. Planning ahead will allow for pro-active inclusion of people and institutions, help bring their knowledge and experiences on board from an early stage onwards, and ensure that their needs and interests are integrated in the final design of the approach, thus avoiding surprises during its implementation. In other words, the benefits of pro-active design of participatory processes are plentiful. The Okavango case study illustrates the effects of participatory approaches being part of the project design [see Ramsar Technical Report on river basin management case studies].

Communicate. Consider the following situations. While the wetland manager may expect to fully take part in decisions on water management, the water authorities may have planned to consult him only on the ecological needs and then to take their decisions by themselves. A provincial government may announce a participatory approach in groundwater management, until it appears that the farmers want something else than is planned in the provincial capital. The Ministry of Environment may wish to integrate water- and environment-related issues, only

to find out that the Ministry of Water has already concluded its next five-year plan, and no further changes can be made.

In all cases, we may assume that all parties worked with good intentions, but they started out with different expectations about the extent to which different stakeholders could participate in planning and decision making. This created misunderstandings and disappointment, and a loss of trust in the possible outcome of the cooperation. Integration of issues is not achieved, and beyond that, this misunderstanding may lead to a deterioration of relationships at a broader scale as well.

Managing expectations is just as important as the participatory process itself. Communicate clearly about the process that is envisioned: who will be involved at which stage, and what will be each party's power of decision-making? Here we find ourselves at the crossroads of CEPA (see Box 1) and participation. With CEPA, we can make sure that people know when they can influence decision-making and when they cannot. As long as everyone understands the possibilities as well as the limitations of their involvement, the risk that conflicts will arise over different expectations will be minimal, and the acceptance of these limitations will often be surprisingly high.

Participate across sectors. Most frequently, stakeholder participation is organized along vertical lines: national governments consulting with regional management boards, or water associations with their local members. Often these types of participation focus on technical and operational matters. However, participation may also refer to horizontal lines: integrating cross-sectoral competencies would require such cooperation, as would mainstreaming of environment in water management policy. Initially this often relates more to managerial and diplomatic levels that need to ensure joint decision-making across sectors or departments, as a prerequisite for cross-sectoral implementation of integrated approaches in water and wetlands management. Organizing such cross-sectoral stakeholder participation often requires the establishment of mechanisms to bring people together, as these usually do not traditionally exist. These mechanisms could take the form of a joint working group, a cooperation platform, or others. The Ruaha case study provides an interesting example on this.

Participate internally. Internal institutional operations greatly influence coordination with external partners. For example, when one of the participating stakeholders keeps sending new representatives to project meetings because of internal problems with continuity, it could become very difficult for the project to build up joint approaches and experiences. Also, when a representative comes without a mandate from his organization, his contribution may not be as constructive. Likewise, if the representative finds his colleagues and bosses uninterested in what he has agreed during the meeting, it is unlikely that his organization will act according to these agreements. These examples show how internal commitment and internal communication is essential for external success. Good exchange, learning and sharing within each participating institution or organization is therefore required for successful communication and cooperation with partners.

Source: Information for this box contributed by Gwen van Boven, SPAN Consultants

End Information Box 8

Information Box 9: Payment for Ecosystem Services in Watersheds

To be completed for Handbook.

This box will provide an overview of developing principles and practices related to payment for ecosystem services in watersheds, brief descriptions of some recent experiences in this field, and pointers to sources of relevant information and guidance.

End Information Box 9

Information Box 10: CEPA in the river basin management cycle

Policy or project making at basin level is a cyclical, iterative process of – generally – four main stages. These stages could be linked to the Critical Path steps as follows:

1. Identification phase / Agenda setting - refer to Critical Path Steps 1, 2 and 3
2. Formulating policy - CP Steps 4, 5 and 6
3. Implementation - CP Steps 7a and 7b
4. Management and control - CP Steps 8 and 9

During each stage, CEPA can play a different role to support the specific requirements at that moment in the project or policy. The managers of the project can use this cycle to decide which CEPA techniques or approaches would be best to use. This can be done from the beginning of the process, but if one has already progressed to a later stage, this cycle could still provide guidance.

Phase 1: Identification of the issue: agenda setting (Critical Path Steps 1, 2, 3)

CEPA serves to identify problems early by listening to people. Is the issue equally important to all stakeholders? How do they perceive the challenges ahead? Does everyone share the same interests or may issues arise over conflicting interests? During this phase, CEPA can help create awareness of a problem and draw attention both to the need for solutions and to the limitations of the context in which any solutions will have to be implemented. When linking this to the Critical Path flow, we see that CEPA could support setting the policy, regulatory and institutional context (CP step 1), help to design and initiate the stakeholder participation process (CP Step 2), and support inventory work (CP Step 3).

CEPA methods used:

- Bringing stakeholders together
- Stakeholder consultations
- Surveys (opinion, attitude)
- Media analysis
- Information meetings and briefings

Phase 2: Formulating the policy or project (Critical Path Steps 4, 5 and 6)

At this stage, CEPA can serve to raise awareness or understanding of the policy proposals and the issues. Based on the scientific and social assessments that have been done, objectives can be set and solutions proposed. CEPA can help explain why certain interventions are not possible and others are necessary, explain what the implications of selected approaches will be, and help

identify the roles and responsibilities of different stakeholders. In this way, CEPA would support priority setting (CP step 4), management objective setting (CP step 5), and the development of water and land use management plans (CP step 6).

Methods:
- KAP (Knowledge, Attitude, Practice) surveys
- Consensus negotiation
- Communication strategy design
- Integration of communication in mix of policy instruments

Phase 3: Implementing the policy or project (CP Steps 7a and 7b)

The aim of communication is now to inform target groups on how to proceed, to communicate the core message of the policy (or project) and accompanying measures. CEPA would here support CP Step 7a (Implementation at wetland level) as well as CP Step 7b (implementation at basin level). The CEPA strategy that was designed under phase 2 would assist that implementation by keeping people informed of progress, and it would fill gaps in knowledge (which were identified through the KAP surveys in the formulation phase) by communicating the core of the measures that are being implemented. It continues the stakeholder participation process and enlists the assistance of NGOs, unions, and other organizations that may function as intermediaries between government and larger sections of society.

Methods:
- Information campaigns
- Development of specific materials
- Marketing, education
- Training
- Stakeholder communication, networking
- Cross-sectoral dialogue

Phase 4: Management and control (CP Steps 8 and 9)

At this stage communication serves to sustain changed attitudes and behaviour by providing feedback on how the implemented policy or project has been understood and perceived by partners and the public. As such it will support CP Step 8: monitoring and reporting and CP Step 9: review, reflect, and revisit priorities & plans for wetlands. It helps explain and consolidate the achievements or, alternatively depending on the situation, needs for further continuation and (renewed) commitment.

Methods:
- Networking
- Information monitoring
- Information provision
- KAP surveys

This last stage is something that may continue alongside all other stages, providing the feedback loops that will help monitor the quality of the project or policy. It will also feed directly into the new agenda-setting phase in response to a concluded cycle that will need following up.

Source: Information contributed by Gwen van Boven, SPAN Consultants

End Information Box 10

Information Box 11: Techniques for functional assessment of wetlands

To be completed for Handbook.

This box will contain updated information and references related to a range of techniques for functional assessment of wetlands, particularly in view of the publication of the Millennium Ecosystem Assessment, since the original information was provided in the 1999 guidance on wetlands and river basin management(Res VII.18).

End Information Box 11

Information Box 12: Spatial planning approaches to facilitate the integration of wetlands into river basin management

To be completed for Handbook.

This box will contain information and references to literature and case studies on various spatial planning approaches that can be applied to develop structured planning processes and to facilitate the integration of wetland services, functions and values into river basin management.

These approaches include, for example:

- Systematic conservation planning for aquatic biodiversity (TNC/WWF);
- Ecosystem Approach (CBD);
- Mountains to the Sea framework (WWF).

End Information Box 12

Information Box 13: Impacts of land use and water development projects

Almost all land uses and development projects, through their use of water, their production of pollutants, or changes to the land surface or soils in the river basin, will have some impact on water quantity and quality and hence could affect wetlands. Water development projects can also have significant impacts, primarily through changes to the hydrological regime in a river basin.

The land uses that can impact most significantly upon rivers and wetlands are forestry, agriculture, mining and extraction activities, industry, and urbanisation. Inappropriate forestry practices, especially in the upper watershed, can lead to increased soil erosion and reduced water retention capacity. Agricultural activities can also cause significant levels of pollutants from agro-chemicals and agricultural wastes. Upland agriculture through land clearing and subsequent operation can have a major negative impact on water quality and can also lead to significant changes in flood and dry season flows. Lowland agriculture can lead to the drainage or conversion of floodplain wetlands, resulting in a loss of biodiversity and natural functions and benefits. In many developing countries, irrigation is the main justification for abstracting water from rivers.

The impact of mining and industrial activities is mainly through the release of pollutants, some of which may be highly toxic and may persist in the environment for very long times, even after the original mining or industrial activity has ceased. In addition, industrial activities or mining can instantly jeopardise entire river basins and all the associated wetlands and biodiversity through accidental spills. Mining and extraction activities can also have very significant impacts on groundwater hydrology and surface water hydrology through modifications to local topography and soils.

Urban areas have impacts through encroachment on wetlands, either directly or through associated infrastructure such as roads, ports, water supply and flood control. In addition the human populations they support bring increased demands on resources and direct pollution.

Water resource development projects are generally aimed at modifying the natural water flows in a river basin for purposes such as storing water through drought periods, preventing floods, transferring water to irrigated agricultural areas, providing industrial and domestic water supply, improving navigation, and generating electricity. Such projects have frequently been developed through the construction of engineered structures such as dams, diversion canals, channelisation of rivers, flood levees, etc. Many such projects, by modifying the natural conditions that have allowed wetlands to develop, have had a significant negative impact on wetlands and associated biodiversity.

Some of the most significant impacts of such projects include: reduction in river flows, blocking of pathways for migratory fish and other aquatic species, increased water pollution levels, disruption of timing of natural floods which maintain wetlands; reduction of sediment and other nutrient input into floodplain wetlands, drainage or permanent inundation of riverine wetlands, and salinisation of surface and groundwater.

Source: Ramsar Handbook 7, 3rd edition.

End Information Box 13

Information Box 14: Involving local communities in monitoring wetlands within river basins

To be completed for Handbook.

This box will contain information and references related to the involvement of local communities in monitoring wetlands. The information in the related box in Handbook 7 (3rd edition) will be updated and expanded.

Several programmes to involve community groups in wetland and river basin management already exist. Some examples include:

- The Global Rivers Environmental Education Network (GREEN) [www.earthforce.org/section/programs/green/] promotes an action-oriented approach to education based on a successful watershed (river basin) education model. Refer to the Convention's CEPA Programme [(Resolution VIII.31, incorporated in Handbook 4, 3rd Edition)] for further consideration of this approach.

- Water Monitoring Alliance (www.watermonitoringalliance.net/)
- Ribbons of Blue
- Every River Has its People

End Information Box 14

Information Box 15: Further reading and sources of additional guidance on integrated river basin management.

To be completed for Handbook.

While preparing the draft Ramsar Technical Report on river basin management, we received numerous submissions referring us to existing case studies, Web sites, networks, projects and programmes that could provide examples of integration of wetlands into river basin management at scales from regional to small sub-basins. We did not follow up on all the possible case studies that are already available or potentially useful, but a list of additional supplementary source materials will be included in the Technical Report, with brief descriptions of the kind of information available so that readers can follow up if they choose. Examples include the GWP Toolbox, CAP-Net, WWF's suite of case studies, and many more.

A similar list will be provided for an information box in a new Handbook based on the consolidated guidance on river basin management.

End Information Box 15

Optional Information Box: Key messages from the MA Wetlands Synthesis

- Wetland ecosystems (including lakes, rivers, marshes, and coastal regions to a depth of 6 meters at low tide) are estimated to cover more than 1,280 million hectares, an area 33% larger than the United States and 50% larger than Brazil. However, this estimate is known to under-represent many wetland types, and further data are required for some geographic regions. More than 50% of specific types of wetlands in parts of North America, Europe, Australia, and New Zealand were destroyed during the twentieth century, and many others in many parts of the world degraded.

- Wetlands deliver a wide range of ecosystem services that contribute to human well-being, such as fish and fiber, water supply, water purification, climate regulation, flood regulation, coastal protection, recreational opportunities, and, increasingly, tourism.

- When both the marketed and non-marketed economic benefits of wetlands are included, the total economic value of unconverted wetlands is often greater than that of converted wetlands.

- A priority when making decisions that directly or indirectly influence wetlands is to ensure that information about the full range of benefits and values provided by different wetland ecosystem services is considered.

- The degradation and loss of wetlands is more rapid than that of other ecosystems. Similarly, the status of both freshwater and coastal wetland species is deteriorating faster than those of other ecosystems.

- The primary indirect drivers of degradation and loss of inland and coastal wetlands have been population growth and increasing economic development. The primary direct drivers of degradation and loss include infrastructure development, land conversion, water withdrawal, eutrophication and pollution, overharvesting and overexploitation, and the introduction of invasive alien species.

- Global climate change is expected to exacerbate the loss and degradation of many wetlands and the loss or decline of their species and to increase the incidence of vector-borne and waterborne diseases in many regions. Excessive nutrient loading is expected to become a growing threat to rivers, lakes, marshes, coastal zones, and coral reefs. Growing pressures from multiple direct drivers increase the likelihood of potentially abrupt changes in wetland ecosystems, which can be large in magnitude and difficult, expensive, or impossible to reverse.

- The projected continued loss and degradation of wetlands will reduce the capacity of wetlands to mitigate impacts and result in further reduction in human well-being (including an increase in the prevalence of disease), especially for poorer people in lower-income countries, where technological solutions are not as readily available. At the same time, demand for many of these services (such as denitrification and flood and storm protection) will increase.

- Physical and economic water scarcity and limited or reduced access to water are major challenges facing society and are key factors limiting economic development in many countries. However, many water resource developments undertaken to increase access to water have not given adequate consideration to harmful trade-offs with other services provided by wetlands.

- Cross-sectoral and ecosystem-based approaches to wetland management — such as river (or lake or aquifer) basin-scale management and integrated coastal zone management — that consider the trade-offs between different wetland ecosystem services are more likely to ensure sustainable development than many existing sectoral approaches and are critical in designing actions in support of the Millennium Development Goals.

- Many of the responses designed with a primary focus on wetlands and water resources will not be sustainable or sufficient unless other indirect and direct drivers of change are addressed. These include actions to eliminate production subsidies, sustainably intensify agriculture, slow climate change, slow nutrient loading, correct market failures, encourage stakeholder participation, and increase transparency and accountability of government and private-sector decision-making.

- Major policy decisions in the next decades will have to address trade-offs among current uses of wetland resources and between current and future uses. Particularly important trade-offs involve those between agricultural production and water quality, land use and biodiversity, water use and aquatic biodiversity, and current water use for irrigation and future agricultural production.

- The adverse effects of climate change, such as sea level rise, coral bleaching, and changes in hydrology and the temperature of water bodies, will lead to a reduction in the services provided by wetlands. Removing the existing pressures on wetlands and improving their resiliency is the most effective method of coping with the adverse effects of climate change. Conserving, maintaining, or rehabilitating wetland ecosystems can be a viable element to an overall climate change mitigation strategy.

- The MA conceptual framework for ecosystems and human well-being provides a framework that supports the promotion and delivery of the Ramsar Convention's "wise use" concept. This enables the existing guidance provided by the Convention for the wise use of all wetlands to be expressed within the context of human wellbeing and poverty alleviation.

End Box: Key messages from the MA Wetlands Synthesis