



Resolution VII.18

"People and Wetlands: The Vital Link"
7th Meeting of the Conference of the Contracting Parties
to the Convention on Wetlands (Ramsar, Iran, 1971),
San José, Costa Rica, 10-18 May 1999

Guidelines for integrating wetland conservation and wise use into river basin management

1. RECALLING Operational Objective 2.2 of the Strategic Plan 1997-2002, which urges Contracting Parties *"to integrate conservation and wise use of wetlands . . . into national, provincial and local planning and decision making on land use, groundwater management, catchment/river basin and coastal zone planning, and all other environmental management"*;
2. FURTHER RECALLING Resolution VI.23 on *Ramsar and Water* which calls on Contracting Parties, in promoting the integration of water resource management and wetland conservation, to undertake a range of actions including the establishment of hydrological monitoring networks on wetlands, studies of traditional water management systems and economic valuation methods, to involve National Ramsar Committees and local stakeholders in river basin management, to support multi-disciplinary training, and to work in partnership with water-related organizations;
3. AWARE that wetlands, because of their ecological and hydrological functions, are an intrinsic part of the overall water resource system and should be managed as a component of such, as well as being rich centres of biological diversity and related productivity; and contribute as such to the economic, ecological and social security of local people and other major groups;
4. WELCOMING the Memorandum of Cooperation with the Convention on Biological Diversity (CBD) and the associated Joint Work Plan through which the role of the Ramsar Convention as the lead partner on actions directed at the conservation and wise use of wetlands, and particularly inland water ecosystems, is to be pursued (Resolution VII.4);
5. ALSO AWARE of the increasing demands being placed upon freshwater resources in many parts of the world, as presented to this Conference through the Technical Session I presentation entitled *Defining Ramsar's role in the response to the global water crisis*;
6. NOTING the importance placed on freshwater resources in the United Nations Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21 (June 1997), and the subsequent Commission on Sustainable Development meeting in May 1998, which as part of its report relating to Strategic Approaches to Freshwater Management recommended support for implementation of the Ramsar Convention;
7. NOTING ALSO the current initiatives of the World Commission on Dams as well as those activities of the World Water Council, the Global Water Partnership, and other water sector-related organizations designed to promote integrated water resource management;

8. RECOGNIZING that through Technical Session I, this Conference has considered and discussed in detail the *Guidelines for integrating wetland conservation and wise use into river basin management*;
9. REALIZING that this Conference, through a number of related decisions, has adopted guidance for the Contracting Parties on wetland policy formulation (Resolution VII.6), reviewing laws and institutions (Resolution VII.7), involving local communities and indigenous people in wetland management (Resolution VII.8), promoting communication, education and public awareness related to wetlands and waterways (Resolution VII.9), designation of karst and other subterranean hydrological systems (Resolution VII.13), incentives (Resolution VII.15), impact assessment (Resolution VII.16), wetland restoration as part of national planning (Resolution VII.17) and international cooperation under the Ramsar Convention (Resolution VII.19), of all which are closely related to and serve to inform the more generic subject of integrating wetlands into river basin management; and
10. GRATEFUL to those who contributed their information and other experiences to assist the authors, the Global Environment Network, with the preparation of the annexed Guidelines and the associated case studies and lessons learned;

THE CONFERENCE OF THE CONTRACTING PARTIES

11. RECOMMENDS the *Guidelines for integrating wetland conservation and wise use into river basin management* as annexed to this Resolution and URGES all Contracting Parties to give priority to their application, adapting them as necessary to suit national situations;
12. CALLS UPON the Contracting Parties to reinforce and increase their efforts to implement Resolution VI.23 and Operational Objective 2.2 of the Strategic Plan 1997-2002 and to do so through implementing the annexed Guidelines;
13. FURTHER URGES Contracting Parties, when implementing the annexed Guidelines, to take account of, and apply through integrated approaches, the guidance on related issues identified above and as adopted by this Conference;
14. DIRECTS the Ramsar Bureau, as funds and human resources allow, to make these and the associated guidelines adopted by this Conference available to the secretariats, expert and technical bodies, relevant regional institutions, river basin authorities and focal points of all other relevant environment conventions as well as interested parties and organizations, and, in particular, to those bodies identified above with a recognized direct interest in water management;
15. FURTHER DIRECTS the Ramsar Bureau and Scientific and Technical Review Panel (STRP), subject to the availability of budgetary resources, to follow and participate actively in the programme of the World Commission on Dams (WCD), providing input on themes of relevance to Contracting Parties, and to report back to Ramsar COP8 concerning the findings of WCD and their implications for the future;
16. ENCOURAGES in particular those Contracting Parties which are also signatories to the Convention on Biological Diversity to note and support the partnership approach being taken between the Conventions in the further development of tools in the areas of

incentives (Resolution VII.15) and impact assessment (Resolution VII.16), which are key elements of the annexed Guidelines;

17. INVITES those Contracting Parties which share river basins to pursue, as appropriate, the application of the annexed Guidelines in a cooperative way with their neighbouring States in accordance with Article 5 of the Convention and the *Guidelines for international cooperation under the Convention* (Resolution VII.19);
18. COMMENDS these Guidelines for consideration by all multilateral and bilateral donors to assist and guide their planning, project assessments and decision-making in terms of integrated water resource management, taking into account the special circumstances and constraints of the concerned countries;
19. INSTRUCES the STRP, as funds and human resources allow, to review the current state of knowledge in the area of allocation and management of water to maintain wetland ecosystem functions, and to report to Ramsar COP8 on the findings, and if possible to provide guidance for the Contracting Parties on this subject;
20. FURTHER ENCOURAGES Contracting Parties and other interested parties to develop pilot activities or projects to promote and implement the guidelines in their countries, and to report to Ramsar COP8 and other relevant fora (such as CBD) on the successes achieved and lessons learned from these activities.

Annex

Guidelines for integrating wetland conservation and wise use into river basin management

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Introduction

1. Wetlands perform a host of ecological and hydrological functions that benefit humankind. Arguably some of the most important functions of wetlands are their roles in water supply, water purification and flood control. Wetlands also perform many other important socio-economic functions, such as provision of habitat for fisheries and forestry resources, and are critical for the conservation of biological diversity.
2. River basins or river catchments (the land area between the source and the mouth of a river including all of the lands that drain into the river) and coastal and marine systems influenced by catchment discharges, are important geographical units for considering the management of wetlands and water resources. Rapid and unsustainable development of wetlands, and the river basins in which they sit, has led to the disruption of natural hydrological cycles. In many cases this has resulted in greater frequency and severity of flooding, drought and pollution. The degradation and loss of wetlands and their biodiversity imposes major economic and social losses and costs to the human populations of these river basins. Thus, appropriate protection and allocation of water to wetlands is essential to enable these ecosystems to survive and continue to provide important goods and services to local communities.
3. In the coming millenium, demands on water resources will continue to increase, as will the levels of pollutants. In order to achieve the goal of sustainable utilisation of freshwater resources, new approaches to water and river basin management are urgently required. In the past the water resources and wetlands have tended to be the responsibility of separate sectoral agencies, frequently with very different objectives and modes of operation. As a result there have been, and continue to be, regular conflicts over water resource use and river basin management. Regrettably, in these considerations wetlands have not always been given the priority they deserve based on the important functions they perform in contributing to the maintenance of healthy and productive river systems.
4. Considering the important roles that wetlands can play in river management, the integration of wetland conservation and wise use into river basin management, as promoted by the Convention on Wetlands (Ramsar, Iran, 1971), is essential in order to maximise and sustain the benefits they together provide to human populations.

Purpose of these guidelines

5. These guidelines were conceived because, though the need to integrate wetlands into river basin management has been recognised by many governments and global institutions, no clear guidance on how to do so has been prescribed under the Ramsar Convention on Wetlands to this point. Therefore, these guidelines are intended to assist the Contracting Parties with pursuing this goal.

Guidance given by the Convention text and previous decisions of the Conference of the Contracting Parties

6. The critical linkage between wetlands, water and river basin management is emphasized in the text of the Convention on Wetlands and in the decisions of the Contracting Parties to the Convention at the triennial conferences. Notably the second paragraph of the Preamble of the Convention text states: *“Considering the fundamental ecological functions of wetlands as regulators of water regime”*, and the 6th Conference of the Contracting Parties (COP6) confirmed through Resolution VI.23 on Ramsar and Water that Contracting Parties *“RECOGNIZE the important hydrological functions of wetlands, including groundwater recharge, water quality improvement and flood alleviation, and the inextricable link between water resources and wetlands, and REALIZE the need for planning at the river basin scale which involves integration of water resources management and wetland conservation.”*
7. Resolution VI.23 further calls upon Contracting Parties, in promoting the integration of water resource management and wetland conservation, to undertake a range of actions (including the establishment of hydrological monitoring networks on wetlands, studies of traditional water management systems and economic valuation methods), to involve National Ramsar Committees and local stakeholders in river basin management, to support multidisciplinary training, and to work in partnership with water-related organizations.
8. Operational Objective 2.2 of the Strategic Plan 1997-2002 approved at COP6 urges Parties *“to integrate conservation and wise use of wetlands . . . into national, provincial and local planning and decision making on land use, groundwater management, catchment/ river basin and coastal zone planning and all other environmental management”*.

Institutional frameworks

Integrated river basin management

9. Integrated water resources management is based on the concept of water being an integral part of an ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its use (Agenda 21, United Nations, 1992). A water source that is reliable, in terms both of its quantity and its quality, is a prerequisite for the survival of human civilization and socio-economic development. Water scarcity, gradual deterioration, aggravated pollution and infrastructure development has increasingly created conflicts over the different uses of this resource. The river basin management approach is an example of an incentive-based participatory mechanism for solving conflicts and allocating water between competing users, including natural ecosystems.

10. A critical requirement for integrated river basin management is the introduction of land use and water planning and management mechanisms which focus at the river basin scale. There is also a need to include consideration of the ecological requirements of marine and coastal systems that are influenced by catchment discharges. There are many steps involved in promoting the integrated approach of water resources management. One of the key issues identified is the division of management responsibilities for one river basin between different administrative authorities, resulting in fragmented approaches to water resources planning and management. It is important to realise that water resource planning and management is a multidisciplinary process and therefore has to be promoted as a collaborative framework among all the relevant agencies operating nationally and those involved within the river basin itself, as well as local communities.

11. Another key issue is the lack of awareness of the cross-sectoral nature of water problems and the need for a new development paradigm towards integrating the technical, economic, environmental, social and legal aspects of water management. The development of administrative units in water resource management has to coincide with river basins' boundaries instead of political boundaries. The lack, or inadequacy, of water legislation and policies is another stumbling block to integrated management of river basin and optimal use of water resources.

12. The following guidelines should be noted:

Section A	
Guidelines for Contracting Parties relating to integrated river basin management	
A1.	Identify the key barriers to integrated river basin management and promotion of land and water use planning/ management within a river basin and work to overcome them.
A2.	Develop consultative processes which involve the various sectors and institutions responsible for water management, environmental protection and agriculture (at least) and a basin-wide plan for the conservation, utilisation and management of the water resources.
A3.	Integrate wetland conservation into river basin management to benefit management goals, such as water supply, flood management, pollution mitigation and the conservation of biological diversity.
A4.	Promote the protection and restoration of wetland areas, and their biodiversity, within river basins.
A5.	Develop appropriate and socially acceptable cost-sharing mechanisms to cover costs involved in the management of river basins.
A6.	Promote the establishment of appropriate mechanisms to bring together all major groups involved in river basin management such as government, municipalities, water regulatory bodies, academic institutions, industries, farmers, local communities, NGOs, etc., to contribute towards the management of the basin.
A.7	Promote appropriate education and public awareness schemes as effective tools for integrated management of river basins. (See the <i>Convention's Outreach Programme</i> , Resolution VII.9.)

Development and strengthening of policy and legislation for integrated water resources management

13. The shift towards integrated water resources management on a river basin scale requires the support of appropriate legislation and policy instruments, including economic instruments such as water pricing policies (e.g. “user pays” and “polluter pays”). Contracting Parties need to put in place appropriate national water policies and legislation to enable and facilitate the planning and integrated management of water resources. These policies need to be harmonised with related policies where they exist such as National Wetlands Policies, National Environment Plans, National Biodiversity Strategies, international agreements and legislative frameworks.

14. In view of the fact that adequate policies at national and sub-national levels are essential to guide the proper development, conservation, administration and use of river basins, it is imperative that all Contracting Parties formulate effective overall policies on the following:
 - 14.1 Allocation of water for the maintenance of all ecosystems including marine and coastal ecosystems;
 - 14.2 Issuance of permits for water abstraction and use;
 - 14.3 Domestic and industrial water use, treatment of effluent and the safe discharge of effluent;
 - 14.4 Agricultural water use, mitigation of effects of large water management structures, return of water, limitations of pesticide and other agro-chemical use;
 - 14.5 Determination of water quality standards for use for various purposes;
 - 14.6 Rules and regulations regarding abstraction and use of groundwater;
 - 14.7 Tariff policies for drinking water supply, agriculture, industrial and other water uses;
 - 14.8 Land and water conservation;
 - 14.9 Integration of water and wetland conservation within the national socio-economic development agenda;
 - 14.10 Invasive species which have an impact on water.
15. The following guidelines should be noted:

Section B

Guidelines for Contracting Parties on the development and strengthening of policy and legislation for integrated water resources management

- B1. Incorporate wetland management issues into existing water or river basin management policies and also incorporate water resource management issues into National Wetland Policies and similar instruments (see Resolution VII.6).
- B2. Review existing legislation and, as appropriate, develop new legislation to facilitate the implementation of key policy issues such as the establishment of River Boards and Commissions; introduction of economic incentives and disincentives, regulation of activities which may negatively affect water management (see Resolution VII.7).
- B3. Develop a comprehensive National Water Policy (Resolution VII.6) or National River Basin Management Policy to regulate activities within river basins and integrate wetland management into the policy and local strategies/action plans.
- B4. Recognising that socio-economic development is often critically dependent on the protection of aquatic ecosystems, encourage different sectors (such as conservation, water, economic development) to collaborate in allocating or securing sufficient resources to implement policies and legislation for integrated water resources management.
- B5. Develop appropriate incentive measures (Resolution VII.15), such as demand management and water pricing strategies to promote water conservation and more efficient and socially acceptable allocation of water resources.

Establishment of river basin management authorities and strengthening of institutional capacity

16. The institutional structures in place for land and water use should permit the integrated management of river basins as single units. Fundamental changes in the administrative structure of water resource management can be achieved through a step by step process. The first step is to establish a process of cooperation and collaboration between the agencies responsible for water resources management, environmental protection, agriculture, etc. Subsequently, representatives of these agencies assist in the establishment of a coordinating authority that assumes responsibility for managing water resources and the wetlands of the river basin.
17. The following guidelines should be noted:

Section C

Guidelines for Contracting Parties for the establishment of river basin management authorities and strengthening of institutional capacity

- C1. Set standards and objectives to be achieved (such as water quality and quantity, physical efficiencies in water use and healthy wetland ecosystems within a river basin) and determine the options and costs of achieving these objectives.
- C2. Make multi-stakeholder river basin management authorities responsible for preparing river basin management plans;
- C3. Where appropriate, the river basin management authorities should consider the development of cost sharing formulas (such as beneficiaries pay, river basin resident levies, government subsidies, environmental costs of degradation/ “impacter pays”, etc.) to raise the funds needed for integrated river basin management, or alternatively seek these resources from the development assistance community;
- C4. Develop mechanisms to facilitate the transfer of resources from downstream beneficiaries to the protection and management of upper catchments and other critical areas;
- C5. Provide training for water/wetland managers at all levels to understand and implement the concepts of integrated water resource and river basin management, including the importance of wetlands;
- C6. Provide adequate financial resources to ensure effective operation of organizations charged with planning and management of water resources, river basin management and wetland conservation and, as appropriate, seek resources from alternative sources, such as debt swap for nature arrangements and the establishment of national or local trust funds;
- C7. Strengthen and maintain the capabilities of local institutions (universities, research institutions and water management agencies) to undertake comprehensive water demand assessments which include ecological water demands;

- C8. Strengthen the protection of the upper catchment and other critical areas elsewhere in the river basin through their inclusion in protected area systems or development of special management strategies;
- C9. Promote the inclusion of staff within river basin management authorities which have expertise in the ecological functions of wetlands.

Involvement of stakeholders, community participation and public awareness

18. An important element within the concept of integrated river basin management is that planning and management institutions work with and for the entire community of water users in the basin, including wetland wildlife and users, as well as relevant stakeholders outside the river basin. In order to identify the needs and concerns of all water users, public participation in the planning and management of water resources is an important goal. (Refer also to Resolution VII.8.)
19. Until relatively recently there was little consultation on river basin and water resource planning in many countries. A management shift has taken place with a greater role being provided for civil society, with recent experience showing that effective collaboration between agencies and local people increases the chance of success in achieving effective river basin plans. Early consultations with the public can also help identify previously unknown uses and values of resources in the basin and help determine the relative importance of different values.
20. The local community can play an important role in managing and monitoring wetlands and rivers. Several programmes to involve community groups in wetland and river basin management already exist. For example, the Global Rivers Environmental Education Network (GREEN) promotes an action-oriented approach to education based on a successful watershed (river basin) education model. It works closely with business, government, community and educational organizations across the United States and Canada and with GREEN country Coordinators in 135 countries around the globe. The network aims to promote and improve the levels of public knowledge through a global education network that promotes sustainable management of river basins. It also supports community-based education through regional partnership activities. Refer to the Convention's Outreach Programme (Resolution VII.9) for further consideration of this approach.
21. The following guidelines should be noted:

Section D

Guidelines for Contracting Parties relating to the involvement of stakeholders, community participation and public awareness (Refer also to Resolutions VII.8 and VII.9)

- D1. Establish mechanisms to identify and involve stakeholders in planning and management of river basins and their wetlands, including a review of the land tenure arrangements within the river basin.
- D2. Facilitate the active participation of stakeholders, responding to their particular needs, and sharing of authority and responsibility for resource management according to arrangements that are agreed by all parties.
- D3. Provide fora for open discussion on river basin management between water management agencies and stakeholders, particularly local communities, to identify the issues, needs and problems of the community.
- D4. Document and promote sustainable wetland and river basin management practices developed through traditional knowledge and skills.
- D5. Support capacity building of community-based organizations and NGOs to develop skills for monitoring or management of resources within river basins, such as through the Global Rivers Environmental Education Network (GREEN) model and programme.
- D6. Develop and implement management plans which take into account the goals and aspirations of the local stakeholders, including the consideration of fair and equitable sharing of benefits, as the success of such plans depends on the effectiveness of public participation and support.
- D7. Identify, design and implement community-based demonstration projects and provide additional economic incentives to the local communities.
- D8. Design and implement communication, awareness and education programmes on the importance of wetland conservation to support water resources management, consistent with the guidelines set out in the *Convention's Outreach Programme* (Resolution VII.9).
- D9. Develop awareness campaigns to minimise those activities leading to the degradation of river systems, such as excessive and incorrect use of inappropriate pesticides and fertilisers, poor sanitation, drainage of wetlands, and clearance of forests in the catchment.

Assessment and enhancement of the role of wetlands in water management

Hydrological functions

- 22. As indicated previously, wetlands perform a host of ecological and hydrological functions. These include mitigating the impacts of floods, reducing erosion, recharging groundwater and maintaining/improving water quality. As such, wetlands can be managed to secure a range of objectives in water resources management, such as to maintain water supply and quality, to recharge groundwaters, to reduce erosion, and to protect the human population from floods.

Assessment of functions

23. In order to maintain or enhance the role of wetlands in water resource management, it is necessary first to identify and assess the benefits which a particular wetland provides. Three steps are needed in this process:
 - 23.1 inventory and description of the wetlands (refer to Resolution VII.20);
 - 23.2 identification of the particular attributes and functions that may play a role in water management;
 - 23.3 quantification of such functions.
24. While it may be desirable to have long-term and detailed studies, it is often more appropriate to use rapid assessment techniques to determine the relative importance and functions of wetlands within a river basin. Initial functional assessment is a process whereby the general physical and biological characteristics of wetlands are used to predict which functions are most likely to be present at a site. This assessment should be carried out together with an initial inventory of wetlands. The assessment is neither definitive nor quantitative. Initial assessments put wetlands on relative scales with respect to particular functions. Initial functional assessment is necessary to estimate the capacity and opportunity of wetlands to meet specific needs. These evaluation assessments can be conducted on wetlands to identify their potential roles in flood control, improving water quality, sediment retention and input into ground water supply.
25. Examples of such functional assessment techniques include The Wetland Evaluation Technique (WET) and Functional Capacity Index, both used by the US Army Corps of Engineers, and the Functional Analysis of European Wetland Ecosystems (FAEWE) method developed in Europe. These techniques incorporate a number of elements including:
 - 25.1 establishment of a database from desk and field studies;
 - 25.2 functional assessment procedures including quantitative and qualitative assessment, assessment of susceptibility to impacts and economic evaluation of functions; and
 - 25.3 modeling and monitoring procedures.

Enhancement of functions

26. Once the functions have been determined, it is possible to assess the role that the wetlands could play in the management of water resources within a river basin. Numerous studies throughout the world have shown that it is almost always more cost-effective to maintain natural wetlands than to drain or convert the wetlands to other (often marginal) uses, and then to try to provide the same services through structural control measures such as dams, embankments, water treatment facilities, etc. In many cases it has also been found cost-effective to restore or even create wetlands to provide these functions rather than create expensive engineering structures.
27. The following guidelines should be noted:

Section E

Guidelines for Contracting Parties relating to assessment and enhancement of the role of wetlands for water management

- E1. Information on functional and biodiversity assessment methodologies and the means for their integration for wetland management should be compiled by the Scientific and Technical Review Panel (STRP) of the Convention and disseminated to Contracting Parties, for their adaptation to local situations.
- E2. Undertake studies to identify the functions and benefits to water management which are provided by the wetlands within each river basin. Based on these findings, Contracting Parties need to urgently protect, through appropriate actions, the remaining wetland areas which contribute to water resource management.
- E3. Consider the rehabilitation or restoration of degraded wetlands, or the creation of additional constructed wetlands within river basins, to provide services related to water management (refer to Resolution VII.17).
- E4. Ensure adequate consideration in river management programmes of non-structural flood control methods which take advantage of the natural functions of wetlands (for example, restoring floodplain wetlands or creating flood corridors) to supplement or replace existing flood control infrastructure.

Identification of current and future supply and demand for water

- 28. An essential component of river basin management is knowledge of both current and future supply and demand upon water resources in a river basin, taking into consideration the possible impacts of climate change. Current and future assessments of the resource need to focus on the human uses of water (such as irrigation, hydro- electricity and domestic or industrial water supply) as well as the ecological needs for water within different parts of a river basin. In this respect, water demands should not only be defined in terms of water quantity but also water quality. Ecological water demands are less obvious and more difficult to quantify and consequently have often been ignored or underestimated in terms of water demand. Ignoring such requirements may lead to major environmental and social problems such as collapse of fisheries or downstream saline intrusion. It is also important to recognise that the greatest damage to the environment may occur during extreme events rather than the average situation.
- 29. Socio-economic systems are constantly changing and therefore it is often necessary to develop a range of future demand scenarios and develop flexible sustainable use strategies which can be adapted to a range of circumstances. Linked to the assessment of water demands is the identification and resolution of the significant water-related problems arising from the demand patterns identified in the scenarios. These problems should not be restricted to issues related to human activities but should also include ecological problems such as adaptation to reduced water supply or quality within certain ecosystems.
- 30. Water demand is mainly determined by the economic incentives for water and wetland use. Provision of incentives for practising environmentally sustainable water use can minimise the impacts on wetland areas. It is critically important to impose water prices that reflect the true cost of supplying water which will encourage the optimisation of water use,

ensuring that in so doing there is recognition of the economic value of other services from wetlands. Within a sectoral policy context, incentives for sustainable use of freshwater resources need to be provided. Equally, environmentally unsound or inequitable incentives which are encouraging practices that are unsustainable need to be identified and removed. (Refer to Resolution VII.15.)

31. The following guidelines should be noted:

Section F	
Guidelines for Contracting Parties relating to the identification of current and future supply and demand for water	
F1.	Undertake assessments of current and potential future water supply and demand for water resources within the river basin to meet both ecological and human requirements and identify areas of potential shortage or conflict.
F2.	Undertake assessments to establish the economic and social costs which are likely to result if the ecological water demands are not met.
F3.	Based on the above assessments, develop mechanisms to solve problems and conflicts over water quantity and quality at both national and river basin levels within the country.
F4.	Develop appropriate demand management and water pricing strategies to assist in sustaining the ecological functions and values of water resources and wetlands.
F5.	Review relevant incentive/perverse incentive measures and consider removing those measures which lead to destruction/degradation of wetlands; introduce or enhance measures which will encourage restoration and wise use of wetlands. (Refer to Resolutions VII.15 and VII.17.)

Minimising the impacts of land use and water development projects on wetlands and their biodiversity

Impacts of land use projects

32. Almost all land uses projects through their use of water, or their production of pollutants, will have some impact on water quantity and quality in the river basin, and hence have an impact on riverine wetlands. Water development projects also have a significant impact and these are dealt with in the following section.
33. The land uses which can impact most significantly on rivers and wetlands are forestry, agriculture, mining, 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 also lead to significant changes in flood and dry season flows. Lowland agriculture can lead to the drainage or

conversion of floodplain wetlands leading to loss of biodiversity and natural functions and benefits. In many developing countries, irrigation is the main justification for abstracting water from rivers.

34. The impact of mining and industrial activities is mainly through the release of pollutants, some of which may be highly toxic (for example, mercury). In addition, industrial activities or mining can instantly jeopardise entire river basins and all the associated wetlands and biodiversity through accidental spills. 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 lead to increased demands on resources and direct pollution.

Assessing and minimising impacts

35. The impact of existing land uses on river systems and associated wetlands needs to be monitored and controlled through the integration of regulations and guidelines on forestry, agricultural, mining or urban waste management. In many cases the implementation of such guidelines may lead to advantages for the land users themselves – for example, reforestation and good forest practices enhance the long-term timber yields; better agricultural practices reduce soil erosion and retain water for the dry season; better waste management improves quality of life and health for urban residents. However, there is normally a need to have a proper monitoring and enforcement mechanism to ensure effective use of the regulations.
36. In terms of control of new development activities, various mechanisms can be used to minimise environmental impacts. The first is environmental assessment and zoning whereby the land use and natural resources of the river basin are surveyed and the basin is zoned according to the different types of land use that may be permitted in each zone without having a significant impact on other zones or the river or wetland systems. There may also be restrictions on particular activities within a zone in order to ensure sustainability.
37. The second measure that is more applicable to proposed new development projects is Environmental Impact Assessment (EIA). EIA provides a framework for assessing the implications of development options on the environment (including wetlands). (Refer to Resolution VII.16.)
38. Thirdly, Cost-Benefit Analysis (CBA) is a tool to calculate the net impact of a project on the economic welfare of society by measuring all the costs and benefits of the project. Although most CBA results can be expressed in monetary terms, some costs such as those arising from the displacement of people and loss of wetland species may be difficult to express in that way. Appropriate decision-making requires an analysis of the economic, social and environmental costs and benefits of water management plans through EIA and CBA.
39. It is important that multidisciplinary teams conduct the processes mentioned above and seek to engage the stakeholders at an early stage.
40. The following guidelines should be noted:

Section G

Guidelines to assist Contracting Parties minimise the impacts of land use projects on wetlands and their biodiversity

- G1. Develop integrated land use plans for each river basin as a means to minimise the impact of different activities and land uses on the river and wetland systems as well as local residents.
- G2. Develop and enforce appropriate regulations to control land uses, especially forestry, agriculture, mining or urban waste management, so as to minimise their impact on river and wetland ecosystems.
- G3. Carry out Environmental Impact Assessment (EIA) and Cost Benefit Analysis (CBA) studies for development projects which may have significant impacts on rivers and wetlands using independent multidisciplinary teams, and in consultation with all stakeholders, and consider alternative proposals including the no-development option.
- G4. Disseminate the findings of any EIA and CBA in a form which can be readily understood by all stakeholders.
- G5. Ensure that there are adequate control and mitigation measures to minimise, or compensate for impacts if development projects are allowed to proceed.

Minimizing the impacts of water development projects

- 41. 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, 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 which have allowed wetlands to develop, have had a significant negative impact on wetlands and associated biodiversity.
- 42. 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.

Assessment and mitigation

- 43. In a number of cases it has been found that the social and economic losses as a result of the degradation of the downstream wetlands have been significantly greater than the benefits gained from the water development project itself. Various methodologies have been developed to help identify potential social and environmental costs consequential of

development activities. These include EIA, CBA, Social Impact Assessment (SIA) and Participatory Rural Appraisal (PRA). (Refer to Resolution VII.16.)

44. However, several of these standard assessment procedures are not so easily applied to water development projects, or to predicting the impacts of complex river-wetland ecosystems. In recent years some specific procedures have been developed for wetland/water resource projects such as Howe et al, *ELA Scoping Manual for Tropical Wetlands* and the Inter-American Development Bank *Manual on Integrating Freshwater Ecosystem Function and Services with Water Development Projects* (in press). Since the wetlands and associated biodiversity to be impacted are often of significance to a broad range of local users, it is important that a mechanism for stakeholder consultation is established early in the project cycle.
45. As discussed in the preceding section, natural wetlands often play an important role in river management and can often be rehabilitated or restored to provide an alternative to generally more costly, engineering solutions to flood control, groundwater recharge and water quality improvements. Alternatives to irrigation and industrial/domestic water supply schemes include water conservation, treatment or recycling and development of alternate crops or industries to suit natural water availability.
46. The following guidelines should be noted:

Section H

Guidelines for Contracting Parties relating to reducing the impact of water development projects on wetlands

- H1. Ensure that proposals for water development projects are carefully reviewed at their initial stages to determine whether non-structural alternatives may be feasible, possible and desirable alternatives.
- H2. Take all necessary actions in order to minimise the impact of water development projects on biodiversity and socio-economic benefits during the construction phase and longer term operation.
- H3. Ensure that the project design/planning process includes a step by step process to integrate environmental issues, especially initial biodiversity/resource surveys, and post-project evaluation and monitoring.
- H4. Incorporate long-term social benefit and cost considerations into the process from the very initial stages of project preparation.

Maintenance of natural water regimes to maintain wetlands

47. Wetland ecosystems depend on the maintenance of the natural water regimes such as flows, quantity and quality, temperature and timing to maintain their biodiversity, functions and values. The natural flow regime can be considered THE most important variable that regulates the ecological integrity of riverine wetland ecosystems. The construction of structures that prevent the flow of water, and of channels that carry water out of the

floodplain faster than would occur naturally, result in the degradation of natural wetlands and eventual loss of the services they provide. In response to these concerns, a number of countries have introduced legislation and guidelines to ensure adequate allocation of water to maintain natural wetland ecosystems.

48. In cases where structural changes are necessary, water development projects involving the alteration of natural flow regimes should adhere to the following guidelines in order to protect or restore wetland ecosystems.
49. The following guidelines should be noted:

Section I

Guidelines for Contracting Parties relating to the maintenance of natural water regimes to maintain wetlands

- I1. Undertake studies to determine the minimum and ideal flows and flow regimes (including seasonal modulation) required to maintain natural riverine wetland ecosystems.
- I2. With this information (I1. above), establish the optimum flow allocations and regimes to maintain key wetlands and other key ecological functions of river basins.
- I3. In situations where available information on biological parameters and physical habitat is inadequate for a definitive decision on the required optimum flow, use the precautionary principle to maintain the natural situation as closely as possible.
- I4. Develop sustainable water allocation plans for the various resource users within the river basin, including allocating water to maintain wetlands.
- I5. Regulate and monitor the impacts of major infrastructure developments (levees, embankments, roadways, weirs, small dams and cuttings) undertaken within river and flood corridors.

Protection and restoration of wetlands, and their biodiversity, in the context of river basin management

50. The protection and restoration of wetlands is an important strategy within each river basin, not only because the wetlands provide services which can assist with water management, but also because wetlands are critical ecosystems that deserve protection and restoration in their own right. (Refer also to Resolution VII.17.)
51. Many wetland-dependent species, especially fish and amphibians, require management in the river basin context to ensure their survival. In most countries, the protection of habitats and wildlife is conducted according to administrative boundaries and not river basin boundaries. This can lead to protection measures for one site or species being nullified by activities elsewhere in the river basin which, for example, block migration of the fish species or water flow to the wetland site. The restoration of degraded wetlands is

one of the most important possibilities for reversing the trend of declining biological diversity within river basins.

52. The following guidelines should be noted:

Section J	
Guidelines for Contracting Parties for the protection and restoration of wetlands and their biodiversity	
J1.	Assess the status of wetlands and their biodiversity in each river basin and, where indicated, undertake the actions needed to provide better protection measures.
J2.	In assessing the status of wetlands in each river basin, consider the inclusion of key sites in the List of Wetlands of International Importance (Ramsar List).
J3.	Ensure that management plans for Ramsar sites are prepared taking into consideration potential off-site impacts from within the river basin, as well as the site-specific issues. (Refer to Resolution 5.7: <i>Guidelines on management planning for Ramsar sites and other wetlands.</i>)
J4.	Review and, where necessary, adjust regulations and procedures for conservation of wetland-related biodiversity, especially for fish and other aquatic species, to protect rare species and prevent over-exploitation of more common species.

International cooperation

Special issues related to shared river basin and wetland systems

53. In cases where a river basin is shared between two or more Contracting Parties, the Ramsar Convention's Article 5 makes it clear that these Parties are expected to cooperate in the management of such resources. (Refer to Resolution VII.19.)
54. The declaration of the Second World Water Forum in Paris, in March 1998, emphasized that riverine countries need to have a common vision for the efficient management and effective protection of shared water resources. One option to consider in achieving such outcomes is the establishment of international river commissions, created by several riverine countries to facilitate consultation and broad coordination.
55. Countries sharing a drainage basin are encouraged to establish frequent specific contacts in order to exchange information on the water resource and its management. Options for this include:
- 55.1 establishing networks for monitoring and exchanging data on the water quality and quantity in the basin,
 - 55.2 a joint analysis of information on the quantity and type of water used for various purposes in each country;
 - 55.3 exchange of information on protection measures for groundwater, upper catchments and wetlands;

- 55.4 sharing of information on structural and non-structural mechanisms for regulating flow for navigation and flood prevention.
56. The aim should be the preparation of technical reports on the river basin, including information on the needs of the local inhabitants in each part of the basin, as well as existing or potential problems in parts of the river basin that require separate or collaborative efforts to deal with them.
57. The following guidelines should be noted:

Section K

Guidelines for Contracting Parties for the management of shared river basins and wetland systems

- K1. Identify and describe shared river basins, document the key issues of common concern in the basin (diagnostic study), and develop formal joint management arrangements or collaboration for development and implementation of action plans to deal with such issues.
- K2. Where appropriate, establish or strengthen bi- or multi-state river basin management commissions to promote international cooperation for shared water resources and wetland management.
- K3. With regard to shared river basins, Contracting Parties should inform the Ramsar Bureau of the establishment of any joint management arrangements and also of actions by other party or non-party states which may lead to changes in the ecological character of sites included in the List of Wetlands of International Importance (Ramsar List) in their own portion of the basin.

Partnership with relevant conventions, organizations and initiatives

58. In order to undertake an effective approach to promoting the integration of wetland conservation and wise use into river basin management, it is important that the Contracting Parties to the Ramsar Convention are aware of, and take into consideration, the related activities of other international conventions, organizations and initiatives.
59. The sustainable use of freshwater has been identified as a critical component of Agenda 21 and as such has been the focus of a series of meetings under the auspices of the United Nation's Commission on Sustainable Development and other UN agencies. Three other international initiatives should be mentioned:
- 59.1 creation of the Global Water Partnership to act as a framework to coordinate efforts to promote integrated water resource management, especially in developing countries;
- 59.2 the development of the Vision for Water, Life and the Environment through the Global Water Commission under the auspices of the World Water Council; and

- 59.3 the establishment by the World Bank and IUCN-The World Conservation Union of the World Commission on Dams.
60. It is important that these and other appropriate guidelines and activities under the framework of the Ramsar Convention serve as a linkage and input to these other initiatives at the international level.
61. In terms of other conventions and agreements, the most relevant in terms of these Guidelines at the global level are as follows:
- 61.3 the Convention on Biological Diversity (CBD) which has identified the conservation of the biodiversity of inland waters as a particular priority. COP4 of the CBD adopted a Joint Work Programme with the Ramsar Convention to address this matter;
- 61.2 the Convention on the Law of the Non-Navigational Uses of International Watercourses (New York, 21 May 1997: not yet in force) which requires states to avoid, eliminate or mitigate significant harm to other watercourse states and establishes detailed rules with regard to the changes in use of any international watercourse. Issues covered include EIA, consultation, joint protection of watercourse ecosystems, pollution control, introduction of alien species, prevention of erosion, siltation, and salt-water intrusion; and
- 61.3 the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).
62. At the regional and river basin level there are over 200 agreements which provide a basis for cooperation in the management of shared water resources.
63. The following guidelines should be noted:

Section L

Guidance for Contracting Parties on partnership with relevant conventions, organizations and initiatives

- L1. Ensure that these guidelines, and other related guidelines under the Ramsar Convention, are brought to the attention of the relevant international conventions, organizations and programmes, with a view to ensuring that the aspirations of the Ramsar Convention are reflected in the activities of these other initiatives.
- L2. Ensure close coordination at the national level between the Ramsar Administrative Authorities and the focal points for other international conventions and agreements related to these subjects.
- L3. Ensure, as appropriate, adequate consideration of wetland related issues in the operation of any regional agreements related to shared river basins and water resources.