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The role of Ramsar in response to the global water crisis

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§1. Introduction

1. In spite of being generally in small and scattered patches, wetlands occupy approximately 6 per cent of the earth's surface and contribute about 25 per cent of the net productivity of the planet's ecosystems. Wetlands are also important reserves of biodiversity, breeding areas, sanctuaries and stopovers for migratory wildlife (Goudie, 1994). In addition to their vital role as the main source of water for human populations, they play other roles of no lesser importance, which together make it possible to maintain the ecological integrity of nature.
2. It is estimated that about half of all wetlands were lost between the beginning of the twentieth century and the 1990s (Goudie, 1994). If this trend continues, water will become the scarcest resource for ecosystems and humans.
3. Even though the relationship between availability and use of water per capita is high, there are regions of the world which almost totally lack this resource and which are exceptions to the general trend. Water's scarcity is determined primarily by climatic, socioeconomic and cultural factors.
4. Increased demand for good-quality water in developing countries in large parts of Africa, Asia, South America and the Caribbean speaks for itself. But inadequate infrastructure for providing water and basic hygiene have left more than 1100 million persons without "safe water," and between 5 and 10 million people die each year from diseases transmitted by or originating in water (Reid, 1998).
5. Urbanization, wasteful consumption and the inefficient use of water resources are contributing to the deterioration of wetlands by modifying the processes that determine the dynamics of the ecosystem. If this trend continues, wetlands will cease to provide support to human life and biodiversity. In order to overcome the water crisis, it is necessary for the world community to understand that wetlands have a limited capacity and that only through the preservation and recovery of their resources, functions and attributes can the water crisis now

affecting the planet be countered (Ramsar Bureau of the Convention on Wetlands , International Conference on Water and Sustainable Development, Paris, 19-21 March 1998).

6. The nature of wetlands as ecosystems should be kept in mind as well as their inevitable interaction with other ecosystems in order to ensure their survival. At its 6th Meeting, held in Brisbane, Australia, in 1996, the Conference of the Contracting Parties to the Convention on Wetlands adopted Resolution VI.23, entitled “Ramsar and Water,” in which, apart from recognizing the important hydrological functions of wetlands, was also recognized “the need to plan at the level of catchment basins or watersheds. This implies integrating the management of water resources and the conservation of wetlands.”
7. Taking into account that ecosystems are basic components of river basins, the sustainability of these basins will depend on recognition of the functions, services and benefits provided by wetlands (Ramsar Information Document No. 11, “Ramsar and water”, Wetlands Convention, 1996). This recognition is the basis for the integrated management model for water resources, in the context of which the wetland ecosystems must continue being the “providers” as well as “end-users”. In essence, the world must become aware that the use of water to satisfy the world’s demands (irrigation, drainage, consumption, basic hygiene, energy) must give priority to wetlands and their ecosystems as suppliers of the water resource.

§2. Tasks and Objectives for the Convention

8. The Convention’s role is “to promote the conservation and wise use of wetlands through national programmes and international cooperation in order to contribute to sustainable development throughout the world” (Proceedings of the Conference of the Parties. 6th meeting of the Contracting Parties, Brisbane, Australia, 1996. Vol. 5/12. Strategic Plan 1997-2002).
9. The Strategic Plan 1997-2002 carefully reviewed the work of the Convention. New strategies based on this review have been evolved to strengthen conservation activities and the use of wetlands, without reducing existing biodiversity or the quality of life that depends on these resources and functions.
10. The advances gained by the Convention since its creation are documented in a wide variety of publications and have recently been condensed in *The Ramsar Convention Manual: A Guide to Wetlands of International Importance*. Destined for the general public, this publication presents a summary of information on the functions of the Convention. The Ramsar Manual describes the main factors that have led to the current status of wetlands, while at the same time suggesting policies to diminish or counter the deleterious effects of human intervention.
11. Before beginning the next section, it is important to make clear that the main difficulty in determining which functions the Convention should assume to counter the water crisis is defined by the fact that the Convention is in effect fulfilling the function for which it was established. Among its recent successes is that of having obtained the accession of new countries, now more than one hundred, with almost 900 sites on the List of Wetlands of International Importance, covering approximately 68,000,000 hectares (Bureau of the

Convention on Wetlands, International Conference on Water and Sustainable Development, Paris, 19-21 March 1998). As a result, there are many countries that have assumed the obligation to promote the wise use of their wetlands through the adoption of adequate policies and norms, the training of specialized personnel and the promotion of an awareness in the general public about the scientific, cultural and economic importance of wetlands. It is hoped that the delay that surely would exist in implementing integrated management plans will be shortened by the call of this Conference of the Contracting Parties, in which the participating countries have become conscious of the urgent need for an approach to management of water resources that is ecologically sound.

§3. Establishing the Convention's Role

12. In determining the functions that the Convention should assume in response to the world water crisis, it will be necessary to maintain the same general approach, conceptual focus and methodology that have governed its activities from its creation to the present, directed first of all toward obtaining the participation of all countries in the Convention and to ensure wise use of wetlands.
13. Any programme in support of conservation, wise use and restoration of wetlands should include environmental projects that ensure sustainable regional gains through the participation of environmental institutions and society in general.
14. Joint participation of parties affected by the water crisis that stand to benefit from the wise use of wetlands, including the general public, governmental agencies, non-governmental organizations (NGOs) and all levels of the education system, will be the best guarantee for effective management.
15. As stated in the Ramsar Manual, one of the principal roles of the Convention is “to help generate policies and programmes in favour of wetlands and to prevent deterioration of wetlands in countries that are Parties to the Convention.” Fulfilment of the theme of the 7th meeting of the Conference of the Parties, “People and Wetlands: The Vital Link”, depends on orienting assistance to developing countries and economies in transition because they are the countries most affected by the water crisis. A reversal of the situation in these countries could be achieved if the Convention promotes programmes that ensure that equality among countries stops being a simple expression of desire and is translated into concrete action. The task of heightening the public's environmental awareness in all countries should also be a priority, and there should be special emphasis on countries with the greatest educational needs.
16. Given the role of the Convention in response to the water crisis, action should be channelled through national programmes and international cooperation within an environmental plan that concentrates most of its effort on the following topics:
 - promoting education and awareness
 - strengthening management capacity
 - scientific research

- cooperation with international conventions
- regional planning
- compliance with regulations for the protection of specific wetlands
- environmental impact assessments (EIAs)
- development of new criteria for surveying wetlands, designating them as Ramsar Sites or including them in the Montreux Record
- efficient implementation of contingency plans

§3.1 Education and Awareness

17. A priority for the Convention should be to strengthen activities already begun to promote environmental education and awareness. Beneficiaries should be all age groups of the population. Nonetheless, a special effort should be made to reach primary education or children, who can be used as multipliers in the effort to reach adults.
18. The main objective of education and awareness is to create a moral and wise attitude toward caring for wetlands, based on a knowledge of their essential components and processes and on an understanding of the need to maintain all of their functions, resources and attributes in order to improve the quality of life now and in the future through conservation and sustainable use.
19. That unequal opportunity of access to formal education exists between the regions of the planet has been eloquently described by Dickinson (1995), with reference to biodiversity and the perception of inhabitants of different regions of the world. According to this author, efforts to conserve diversity are not geographically uniform. Interest increases as distance increases from sites where conservation of diversity is most seriously threatened. Concern for biodiversity is greatest where diversity is least affected; where those who are interested in maintaining biodiversity have most of their basic needs satisfied. They are not, however, among of the inhabitants of the areas most affected by deterioration of the environment. Lack of a clear perception of a need to protect the environment for wise use is compounded by poverty and a low cultural level of large sectors of the population that have not had access to even basic formal education.

§3.2 Strengthening Management Capacity

20. Strengthening the management capacity of environmental agencies is essential to achieving efficient protection and wise use of wetlands. In order for this to happen, it is recommended that special emphasis be placed on implementation of actions for full enforcement of environmental regulations and strengthening environmental training for government officials and technicians.
21. The seventh meeting of the Conference of the Parties offers an excellent opportunity to bring together important environmental officials in participating countries in order to discuss environmental problems and to define the best way to contribute to a decrease in the negative effects of the water crisis. The following important topics should be proposed to the Contracting Parties to strengthen management capacity.

- implementation of institutional framework that avoids duplication of work by institutions carrying out similar functions
- implementation of strategies guaranteeing continuity of sustainable environmental plans, free from political changes
- adoption of guidelines defining standards of technical
- qualifications of officials who take decisions on environmental issues
- training of government officials responsible for aspects of the environment at local and regional levels
- establishment of environmental management policies in function of the natural area of influence of wetlands and not in function of arbitrary limits on the environment determined by political considerations

§3.3 Scientific Research

22. As the list of wetlands identified in Contracting Parties increases, even though fewer of these are declared to be of international importance, greater will be the knowledge of their functions, resources and attributes and the community's concern for protecting them.
23. Because the Convention's permanent role includes gathering information for updating the inventory of wetlands and evaluating proposed Ramsar Sites or sites to be included in the Montreux Record, one function of the Convention that will contribute substantially to these ends is the promotion of scientific research through funds from the Ramsar Small Grants Fund (SGF).
24. Because not all Contracting Parties have access to the SGF, the Convention should promote wide diffusion of information to interested parties about existing subsidies and fellowships for training and research offered by countries through the public and private sectors.
25. Expanding scientific research will contribute to:
 - improvements in surveys of wetlands
 - designation of new Ramsar Sites or their inclusion in the Montreux Record
 - increased understanding of the status of wetlands, drafting of rational management proposals to promote conservation or recovery
 - training of human resources
26. The last of these aspects is critical in several Parties to the Convention. The training of scientists at research centres or universities concentrating on topics concerning water is one of the actions that should be promoted.
27. On the basis of this information, the Convention should set as a permanent task the preparation of policies for bringing up to date an inventory of institutes, research centres and university departments in all regions of the world involved in topics concerning water

(hydrology, marine biology, limnology, fisheries biology, etc.) or in regional studies that include aspects of the subject of water.

28. Another pertinent recommendation is that of expanding emphasis on international cooperation among neighbouring countries with transborder wetlands to include the promotion of international cooperation among distant countries, which, because of the characteristics of their aquatic ecosystems and their being affected by similar environmental problems, make it possible to carry out comparative studies leading hopefully to the solution of scientific and practical problems related to the water crisis.
29. Among research priorities, the Convention should continue to give importance to ecosystems with high biological diversity and subject to increasing deterioration.
30. In the case of the biocenosis of coral reefs, international recognition of its importance to conservation should be made evident to the public and environmental decision makers. Peck (1995) point out, based on a proposal by Sue Wells (1984, IUCN Bulletin 15: 4-6, pp. 56-57), the need for Ramsar to be the instrument for this recognition and for the conservation of these communities. One of the functions of Ramsar can be directed to promoting information on research that makes it possible to evaluate anthropogenic impact on coral reefs and on the beneficial effect of protecting the coast, fishery resources and tourism. The degradation that coral communities are suffering in southeast Asia and the Caribbean is a vivid example of the interference that the combination of natural and anthropogenic factors produce on the complex and intricate biotic interactions of the ecosystem (wetlands) that they occupy.
31. The natural or induced increase in water temperature has made symbiotic alga abandon their hosts and makes them more susceptible to the forces of mortality. A greater concentration of sediments caused by coastal development blocks the penetration of sun light, decreasing survival rates of corals and increasing their vulnerability to infection. The addition of large amounts of sewage and agricultural runoff promotes an increase in plankton and consumers of plankton, especially predators such as starfish, which prefer to feed on corals (Chadwick, 1998).
32. Mangroves also deserve special attention. Their conservation status should be surveyed in order that Ramsar Sites be more representative of existing ecosystems. The evaluation of the most important parameters of the index of conservation of mangroves (Dinerstein et al., 1995) could be one of the priority themes for research in the future.
33. The biocenosis of mangroves forms one of the most diverse and productive coastal wetlands on the planet. In many regions, the deforestation of mangroves has multiplying effects, which are manifest in the decline in fisheries, degradation in water quality, salinization of coastal soils, erosion, subsidence of the land and a decrease in the release of carbon dioxide into the atmosphere. Coastal mangroves produce more carbon dioxide per hectare than all the phytoplankton of the tropical oceans (Quarto and Cissna, 1997). The urgent need for the rational use, reversion of degradation and recuperation of mangroves has been well understood by the Mangrove Action Project (MAP), created in 1992, whose international

network is comprised of more than 350 NGOs and about 200 scientists from more than fifty countries.

34. Closely related to the protection of mangroves, a global group was formed at the end of 1997 to counter the destruction caused by the industrial raising of shrimp. It is called the Industrial Shrimp Action Network or ISA Net. The initial meeting of this group was held in Santa Barbara, California, where environmental and community organizations agreed to create a group to oppose the world expansion of the industrial raising of shrimp, promoters of the destruction of millions of hectares of important coastal wetlands, including mangroves.

§3.4 Cooperation with Environmental Conventions

35. The strengthening of cooperation and the undertaking of complementary action with international environmental conventions with which there is a shared interest of conservation of the ecosystems and their wise use have been two of the most intense activities of the Convention. While all the conventions with which the Ramsar Convention interacts are important, special consideration is warranted for two conventions, probably because they deal with the two environmental questions of greatest universal importance: climate change and biodiversity.
36. Dr. Ken Lum, special consultant to Ramsar, in a document entitled: “Wetlands and climate change: a report from Kyoto” (1998), provides a summary of the most important aspects of the Third Conference of the Contracting Parties to the Convention on Climate Change, held in Kyoto in 1997. The three recommendations made in this summary seek to promote the recovery of wetlands and other ecosystems whose structure and dynamics have been dramatically disturbed by the warming of the climate:
 - immediate adoption of measures to reduce the emission of greenhouse gases
 - recognition of the inertia of climate change and of the resulting gradual nature of any measure taken to attenuate global warming
 - search for other sources of energy that do not involve the emission of carbon
37. If we continue to emit greenhouse gases, warns Ken Lum, changes in the worldwide distribution of wetlands and their negative effects on the quantity of available water, fishery resources, biodiversity and tourism are predictable. He considers that the problems discussed at the Kyoto Conference present an opportunity for Ramsar and everyone interested in wetlands to participate in the drafting of guidelines and norms for the evaluation of the different types of wetlands that will serve as a basis for the third report of the Intergovernmental Panel on Climate Change (IPCC), the approval of which is expected by the end of 2000.
38. The close ties that the Ramsar Convention has maintained with the Convention on Biodiversity (CBD) were strengthened by the signing of a Memorandum of Cooperation in Geneva, on 19 January 1996, and the adoption of Resolution VI.9 by COP6 of Ramsar in March of the same year in Brisbane, Australia. This tie promoting cooperation between both

conventions was significantly strengthened by the IV Conference of the Parties of the CBD, held in May 1998 in Bratislava, Slovakia, at which Decisions IV.4, IV.5, IV.10 and IV.15 were taken; decisions in which the common objectives of both conventions converge. Finally, COP7 of Ramsar in Document 15.4, Annexe I, clearly laid out the Joint Work Plan 1998-1999 for both conventions. It should also be pointed out that almost simultaneously with the signing of the Memorandum of Geneva, on the occasion of the first 25 years of Ramsar, the role of the Convention in the conservation and wise use of biodiversity is stated in the document "Wetlands, Biodiversity and the Ramsar Convention (1996-1997)." The broad coverage of common topics and objectives left little out of the joint programme. It is important to point out, nonetheless, that the object of study, conservation and wise management of the Ramsar Convention is the ecosystem, a natural unit, that together with genes and species is one of the three components of biodiversity. Taking this into account, the loss of biodiversity is directly tied to the loss of ecosystems, and the erosion of biodiversity is directly tied to the loss of wetlands in this century. As a result, it is valid that the Ramsar Convention promote awareness in the general public and in public officials dealing with environmental topics, so that they can understand to which degree the loss of wetlands is associated with the loss of biodiversity.

§3.5 Adoption of New Regional Planning

39. The use of wetlands will be compatible with the basic principles of sustainable development if all management promoting conservation and recovery is associated with regional planning based on the spatial dimensions of natural processes having their origin in these ecosystems and not on sectorial considerations (OAS, 1984). A task that could be proposed to the Convention is that of influencing Contracting Parties to adopt their own regional planning along lines agreed by the region.

§3.6 Compliance with norms for the protection of specific wetlands

40. The stability of the structure and functioning of wetlands can be threatened by construction with disruptive factors that affect the biotic components that sustain the biodiversity of a region or components of the physical environment. Any undertaking that might negatively affect the components and natural processes of these ecosystems should respect the general and specific guidelines set by the Convention, as well as local and regional norms.
41. Each Contracting Party should ensure that all projects that can affect, in practice or potentially, the natural functions of a wetland or a group of wetlands take into account the status of the wetland within the Ramsar Convention, either as a recognized Ramsar Site or as a site included in the Montreux Record. In summary, the Ramsar Convention should be taken into account in all cases.

§3.7 Environmental Impact Assessment (EIA)

42. The definition by Pritchard (1966) of Environmental Impact Assessment (EIA) can be stated as "the process of predicting and evaluating the effects of an action or a series of actions on the environment, the result of which is used as a tool for planning or decision making. An

EIA is an attempt to prevent environmental degradation by making available to planners and decision makers the best information possible about the consequences that the actions (development) could have on the environment, although an EIA alone is insufficient to prevent degradation. The use of an EIA is multidisciplinary, systematic and predictable, as opposed to the more retrospective process of the environmental survey.” Pitchard adds to his definition the key principles of the EIA, which were accepted by the Contracting Parties to the Ramsar Convention. Many of these principles are general in scope and for this reason are shared by other conventions or international organizations. It is opportune, nonetheless, to mention one of them because it defines the “sphere of influence” that should be considered in evaluating an impact on wetlands. This principle holds that “an EIA should not be restricted simply to the site of a planned development or an identified wetland, but should take into account external influences (e.g. up stream/down stream) and consider the interaction between all components of the hydrological system at the level of the natural area of drainage.”

43. COP7 will be a propitious opportunity for the Convention to stimulate the Contracting Parties to discuss, define and agree on approaches and methodologies for EIAs that cover wetlands and watersheds. It would be appropriate that planners and decision makers have access to EIAs that are succinct and understandable in order to make their work more effective and the decisions they adopt more rapid. This will encourage development compatible with the concept of wise use and lead to the rejection of development that is ecologically incompatible.
44. Another proposal that the Convention can make to the Contracting Parties is that of discussing methodological approaches to different types of programmes or developments that can interfere with the components and processes of wetlands and their water basins. Of special importance, for example, are projects for protecting against flooding, which can include a range of constructions and interventions such as drainage, channelling, straightening streams, dredging, landfills and stabilization of bridges and shores. In spite of the differences between various types of protective constructions against flooding, their impact can be measured with similar methodological approaches, based on graphics and matrices of easily accessible to decision makers (Schnack et al., 1995).
45. Some development has perhaps no apparent link with the deterioration that it can cause in wetlands as ecosystems. Deterioration is more closely identified, at least in the public’s mind, with water as a resource *per se*. One of the factors contributing to the water crisis is related to the construction of tourist centres. In these cases, it is appropriate that the EIAs also include an analysis of projected consumption of water and an estimate of the effect of increased consumption on the decrease in water as a resource. Although tourism is considered by some as a non-polluting industry, its impact on the exhaustion of water as a resource is, nonetheless, significant. It is perhaps appropriate to suggest that the Ramsar Convention request the Contracting Parties, independently of the inherent aspects of the EIA, to intensify educational and awareness campaigns. These efforts can be similar to those used by some hotel chains in cooperation with governmental agencies (e.g. hotels of the United States of America and the Environmental Protection Agency), which propose to tourists measures to avoid an excessive consumption of water.

§3.8 Adoption of New Criteria for Classifying Wetlands

46. One of the functions to which the Convention should give special attention concerns the setting of new criteria for classifying wetlands. Until now, the prevalent criteria have been those of classifying wetlands by their birdlife and, more recently, by their fishery resources. Now would be a good time to insist on the use of other criteria, such as the degree of deterioration of temporary microlimnotypes, susceptibility to flooding, other taxa apart from birds and fish (e.g. amphibians, because adult amphibians play a regulatory role in the trophic dynamics of ecosystems), the trophic state of an ecosystem or organisms that are indicators of contamination (especially in the benthic community).

§3.9 Efficient Preparation of Contingency Plans

47. Many countries are not properly prepared to face emergency situations caused by unexpected events significantly affecting water quality, in both its vital role for biotic communities and for human consumption.
48. Oil spills produced by collisions of oil tankers are perhaps illustrative alarms. Their impact on ecosystems is especially important when they affect birdlife, although they affect all biotic communities negatively.
49. Quite frequently, local or regional governmental agencies are the object of criticism because of a lack of means to intervene rapidly and effectively to neutralize the causes of environmental disasters. The major responsibility for these events lies with the private sector that, as in the case of oil spills, does not properly implement contingency plans because of a lack of strict controls in the regions where they operate.
50. The serious consequences that these events can have on aquatic ecosystems and human populations that use this water for consumption should be considered by the Convention as a topic for discussion by the Contracting Parties. The capacity of the private sector to meet urgent contingencies should be evaluated and minimum requirements should be set for these activities.

§4. Conclusions

51. The role of the Convention should continue to be determined by the spirit of its Global Mission and the stated Objectives. The effectiveness of programmes designed to attenuate the negative affects of the water crisis will depend on the guidelines that the Convention gives to the Contracting Parties in order to strengthen and update the considerations described above. The efficient implementation of the functions that the Ramsar Convention should carry out to counter the water crisis will be fulfilled only:
- if there is greater equity in the satisfaction of basic human needs

- if planners, decision makers and the general public become aware of the need to plan at the level of water basins or watersheds, thus integrating the management of the water resources and the conservation of wetlands
- if it is understood that wetlands can provide water for different uses, only if it is given the status of a user of water as a resource

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