

Ramsar
Handbooks
4th edition

Handbook 8

Water-related guidance





About the Convention on Wetlands

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is “the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world”. As of October 2010, 160 nations have joined the Convention as Contracting Parties, and more than 1900 wetlands around the world, covering over 186 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International Importance.

What are wetlands?

As defined by the Convention, wetlands include a wide variety of habitats such as marshes, peatlands, floodplains, rivers and lakes, and coastal areas such as saltmarshes, mangroves, and seagrass beds, but also coral reefs and other marine areas no deeper than six metres at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs.

About this series of handbooks

This series has been prepared by the Secretariat of the Convention following the 7th, 8th 9th, and 10th meetings of the Conference of the Contracting Parties (COP7, COP8, COP9 and COP10) held, respectively, in San José, Costa Rica, in May 1999, Valencia, Spain, in November 2002, Kampala, Uganda, in November 2005, and Changwon, Republic of Korea, October-November 2008. The guidelines on various matters adopted by the Parties at those and earlier COPs have been prepared as a series of handbooks to assist those with an interest in, or directly involved with, implementation of the Convention at the international, regional, national, subnational or local levels. Each handbook brings together, subject by subject, the various relevant guidances adopted by Parties, supplemented by additional material from COP information papers, case studies and other relevant publications so as to illustrate key aspects of the guidelines. The handbooks are available in the three working languages of the Convention (English, French, and Spanish).

The table on the inside back cover lists the full scope of the subjects covered by this handbook series at present. Additional handbooks will be prepared to include any further guidance adopted by future meetings of the Conference of the Contracting Parties. The Ramsar Convention promotes an integrated package of actions to ensure the conservation and wise use of wetlands. In recognition of these integrated approaches, the reader will find that within each handbook there are numerous cross-references to others in the series.

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Ramsar handbooks for the wise use of wetlands
4th edition, 2010

Handbook 8

Water-related guidance

An Integrated
Framework for the
Convention's water-
related guidance



This 4th edition of the Ramsar Handbooks replaces the series published in 2007. It includes relevant guidance adopted by several meetings of the Conference of the Parties, in particular COP7 (1999), COP8 (2002), COP9 (2005), and COP10 (2008), as well as selected background documents presented at these COPs.

Acknowledgements

This *Integrated Framework for the Ramsar Convention's water-related guidance* was prepared for the Convention's Scientific and Technical Review Panel (STRP) and its Working Group on water resource management during 2003-2005 by Heather MacKay (South African Water Research Institute, co-lead of STRP Working Group 3) with input from the other members of the Working Group, including co-lead Rebecca Tharme (International Water Management Institute), Max Finlayson (International Water Management Institute), Jorge Jiménez Ramón (Organización para Estudios Tropicales), Mike Acreman (Centre for Ecology and Hydrology), Christoph Zöckler (UNEP-WCMC), Carmen Revenga (World Resources Institute), David Coates (CBD Secretariat), and Frank Alberts (RIZA – The Netherlands), with the assistance of the Ramsar Secretariat (organizational affiliations relate to the 2003-2005 period). The Ramsar Secretariat is most grateful to the South African Water Research Institute for its in-kind support to the STRP for this work to be undertaken. The elements of guidance which were added at the 10th meeting of the Conference of the Contracting Parties (COP10, Republic of Korea, 2008) were also developed by the STRP.

All Resolutions of the Ramsar COPs are available from the Convention's Web site at www.ramsar.org/resolutions. Background documents referred to in these handbooks are available at www.ramsar.org/cop7-docs, www.ramsar.org/cop8-docs, www.ramsar.org/cop9-docs, and www.ramsar.org/cop10-docs.



Careful allocation of water resources is especially important in arid areas, as at this High Andean Ramsar site in Chile, the Salar del Huasco. *Photo: Luis Sanchez A.*

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Getting the most out of this Handbook

The Handbooks in general

The purpose of the Ramsar Handbooks is to organize guidance material from relevant decisions adopted by the Contracting Parties over the years, according to subject themes. This helps practitioners to implement the internationally-agreed best practice in a way that is convenient to handle and more naturally matches their own everyday working environment.

The intended readership includes national and local staff of the government departments, ministries and agencies that act as Administrative Authorities for the Ramsar Convention in each country. Equally important users in many cases are managers of individual wetland areas, as some aspects of the guidance relate specifically to site management.

The Ramsar guidance has been adopted by member governments as a whole, and increasingly it addresses itself to the crucial roles of other sectors beyond the “environment” or “water” sectors. It is thus very important that these Handbooks should be used by **all** whose actions may benefit from or impact upon the wise use of wetlands.

A vital first step in each country therefore is to ensure adequate **dissemination** of these Handbooks to all who need or can benefit from them. Copies are freely available in PDF format from the Ramsar Secretariat in three languages on CD-ROM or by download from the Convention website (www.ramsar.org).

Other early steps would be, in each particular context, to **clarify** lines of responsibility and **actively check** how to align the terms used and approaches described with the reader’s own jurisdiction, operating circumstances, and organizational structures.

Much of the text can be used in a **proactive sense**, as a basis for framing policies, plans and activities, sometimes by simply importing relevant sections into national and local materials. It can also be used in a **reactive sense** as a source of help and ideas for responding to problems and opportunities, navigating subjects by the need of the user.

Cross-references, original sources, and further reading are liberally cited: the Handbooks will often not be the “last word”, but they provide a helpful “route-map” to further sources of information and support.

Strategic direction in the Ramsar Convention is provided by the Strategic Plan, the latest version of which was adopted by COP10 in 2008 for the period 2009-2015. All thematic implementation frameworks, including the Handbooks, sit within the context of the goals and strategies of this Plan and the priorities it highlights for the period covered.

In this fourth edition of the Handbooks, additions to and omissions from the text of the original guidelines, required by the results of COP8, COP9 and COP10, are shown in square brackets [...].

The Handbook series is updated after each meeting of the Conference of the Parties, and feedback on user experience is always appreciated in helping to refine each new edition.

This Handbook (Water-related guidance)

Strategy 1.3 of the Strategic Plan 2009-2015, on Policy, legislation and institutions, includes Key Result Area 1.3.i (to be achieved by 2015) which foresees “National Wetland Policy or equivalent instruments fully in place alongside and integrated with other strategic and planning processes by all Parties, including poverty eradication strategies, water resources management and water efficiency plans, coastal and marine resource management plans, national forest programmes, national strategies for sustainable development, and national policies or measures on agriculture”.

Strategy 1.4 on Cross-sectoral recognition of wetland services is to “Increase recognition of and attention in decision-making to the significance of wetlands for reasons of (...) water supply”.

Strategy 1.7, on Integrated Water Resources Management, is to “Ensure that policies and implementation of Integrated Water Resources Management (IWRM), applying an ecosystem-based approach, are included in the planning activities in all Contracting Parties and in their decision-making processes, particularly concerning groundwater management, catchment/river basin management, coastal and nearshore marine zone planning, and climate change mitigation and/or adaptation activities”. There are five corresponding KRAs, including 1.7.ii, which states: “All Parties, in their water governance and management, to be managing wetlands as natural water infrastructure integral to water resource management at the scale of river basins”.

The text in this Handbook is drawn mainly from Resolution IX.1 and its Annex C, and the substance of it thus reflects formal decisions adopted by the Conference of Contracting Parties. The Handbook also brings together other resource materials relevant to the issue of wetland and water management, and the views expressed in these additional materials do not necessarily reflect the views of the Ramsar Secretariat or the Contracting Parties, and such additional materials have not been endorsed by the Conference of the Contracting Parties.

Foreword

Since its inception, the Ramsar Convention has recognized “the fundamental ecological functions of wetlands as regulators of water regimes” (preamble to Convention text), but it has only been since the mid-1990s that Contracting Parties have begun to pay greater attention to the importance of the interrelationships between water and wetlands, starting with COP6 Resolution VI.23 on “Ramsar and Water” (1996). Since then, the Convention has adopted an increasing suite of technical and policy guidance, prepared by its Scientific and Technical Review Panel, to assist Contracting Parties in tackling the increasingly urgent issue of sustainable water resource management, taking account of the critical role that wetlands play in maintaining the global hydrological (water) cycle.

There is considerable mutual benefit in achieving better recognition of the complex role that different types of wetlands play in securing continuing water quantity and quality for both people and biodiversity, through the water provisioning and regulating services they provide. Wetlands by definition depend on water, but making water available to people also depends upon wetlands, and this has yet to be fully understood by the sectoral processes often involved in water management. But it is increasingly clear that maintaining healthy wetlands not only contributes to securing water supplies for people (often, but not only, the poorest communities) but it also maintains the wetland biological diversity which in turn supports the livelihoods of many local communities and indigenous peoples. There is thus a huge ‘win’ to be gained from maintaining the hydrological functions of wetlands.

To achieve this requires better collaboration and understanding between the water management and ‘nature conservation’ sectors of governance and decision-making, since wetland benefits/services are not always obvious or easy to understand or quantify.

With the increasing range and complexity of the guidance documents on water-related issues adopted by the Ramsar Convention, in 2004 the Convention’s STRP recognized that there was a growing need to provide a ‘road-map’ showing when and how to apply each of its components. This framework guidance has been prepared to address this need.

It has also helped the STRP to identify where there are key gaps in the current suite of guidance, and this has informed the future priorities for STRP’s further work on water-related guidance, including on aspects of wetlands and water quality.

This framework is essential reading for all of us involved in water management and in the conservation and wise use of wetlands. It clearly sets out the role of the Ramsar Convention in maintaining the global hydrological cycle, maps out the available tools for achieving this, and identifies the gaps remaining in the guidance which are yet to be filled to help address the issue.

Not only should Ramsar’s community read this framework as a key to their delivery of commitments to the Convention, they must share it with their water resource management colleagues as the basis for better understanding and collaboration in the future, so that the world’s ever decreasing water resources are used to maximum benefit to society . . . and wetlands.

An Integrated Framework for the Ramsar Convention's water-related guidance

(adopted as Annex C to Resolution IX.1 by the 9th meeting of the Conference of the Contracting Parties, Kampala, Uganda, 2005, [as amended inter alia by the Annex to Resolution X.19 adopted by the 10th COP, Changwon, Republic of Korea, 2008])

Relevant implementation commitments made by Contracting Parties in COP Resolutions & Recommendations

Resolution VI.23: Ramsar and water

1. RECOGNIZING the important hydrological functions of wetlands, including groundwater recharge, water quality improvement and flood alleviation, and the inextricable link between water resources and wetlands;

THE CONFERENCE OF THE CONTRACTING PARTIES

7. CALLS on the Contracting Parties (...)
 - d) to ensure that National Ramsar Committees are involved in national water planning and the development of river basin management strategies; (...)
 - g) to ensure, through partnerships with water related organisations such as the World Water Council, that the Ramsar Convention becomes an audible voice in water debates.

Resolution VIII.1: Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands

THE CONFERENCE OF THE CONTRACTING PARTIES

16. STRONGLY URGES all Contracting Parties to bring the Guidelines for allocation and management of water for maintaining the ecological functions of wetlands (...) to the attention of their national ministries and/or agencies (...) responsible for water resource management, to encourage these bodies to apply the guidance in order to ensure appropriate allocation and management of water for maintaining the ecological functions of wetlands in their territory, and to ensure that the principles contained in the Ramsar Guidelines are incorporated into their national policies on water and on wetlands;
17. FURTHER URGES Contracting Parties to include representatives of national water management ministries and/or agencies in the membership of their National Ramsar/Wetland Committees.

Resolution IX.1: Additional scientific and technical guidance for implementing the Ramsar wise use concept

THE CONFERENCE OF THE CONTRACTING PARTIES

7. WELCOMES the frameworks, guidelines and other advice provided as annexes C, D, and E to this Resolution and URGES Contracting Parties to make good use of them as appropriate, adapting them as necessary to suit national conditions and circumstances and within the frameworks of existing regional initiatives and commitments and in the context of sustainable development.

What is in this document?

This document presents a framework for Ramsar's current and developing suite of water-related guidance. The document:

- establishes and provides background on the links between wetland ecosystems and water resources management, through the hydrological cycle;
- explores how Ramsar's water-related guidance addresses water in the context of the hydrological cycle;
- illustrates Ramsar's role in integrated water resources management;
- explains the linkages between the various elements of Ramsar's water-related guidance (scientific tools, policy and institutional aspects, basin planning and management frameworks); and
- indicates cross-references to other Ramsar guidance related to the conservation and wise use of wetlands.

1. Water and Ramsar – an overview

1.1 Why does the Ramsar Convention need to be concerned about water?

1. The hydrological cycle operates at various levels, from planetary through continental scales to river basins and catchments. Wetland ecosystems, in their many shapes, sizes and characters, are integral components of the hydrological cycle and are critically important in regulating the quantity, quality and reliability of water as it moves in its various forms (vapour, liquid, ice or snow) through the hydrological cycle.
2. Wetland ecosystems evolve and function within particular physical templates, the characteristics of which are determined primarily by the interaction between water and sediment. Water carves out channels, valleys and basins; sediment moves through these, sometimes accumulating, sometimes being flushed out by flowing water. The constant interplay between sediment and water has created and continues to create a diverse range of aquatic habitats, both on the land surface in rivers, estuaries, marshes and lakes, and beneath it in caves and aquifers.
3. Chemistry modifies these habitats, as rocks and sediments are weathered and influence the range of different chemical signatures that water can display in the environment. People and biodiversity find their preferred places in this rich array of physical and chemical combinations, creating links between themselves and their habitat, and then in turn modifying their habitat or creating new habitats, through various physical, biochemical and ecological processes (such as nitrogen fixation, photosynthesis and decomposition).
4. Over-abstraction of water from wetlands, from the water catchments in which they occur, and pollution of the water which feeds them, can all lead to significant changes in wetland ecological processes. These usually lead to changes in the physical and chemical habitat templates and a

resulting, generally irreversible, loss of biodiversity. No amount of careful land management or vegetation management can mitigate these changes. Wetland ecosystems need water, in the right amount, at the right time, and of the right quality.

5. The key message here is: *“No water, no wetlands”*.

1.2 Why do water managers need to be involved with the Ramsar Convention?

6. Most of the water which is utilised to meet human needs is extracted in the liquid form from surface water resources and groundwater bodies. While some fresh water is obtained through techniques such as fog harvesting and desalination, this currently serves only a small percentage of people’s needs. The quantity, quality and reliability of fresh surface water and groundwater supplies are determined by the nature of the wetland ecosystems within which that water is found.
7. Changes to wetland ecosystems, particularly to their structure and function, can lead to significant changes in the flow patterns and chemical and microbiological signatures of water resources. Changes in water resources, particularly in their predictability, can have profound impacts for the people who depend on those resources for basic drinking water, sanitation, food production, economic production and maintenance of social and cultural integrity.
8. If water managers are to be able to provide water and water-related benefits/services to the people of the world on a sustainable basis, then water resources need to be managed and protected in a way that recognises these resources as an integral part of the complex ecosystems that sustain them.
9. Wetland ecosystems are the primary resources from which water and all its benefits for humans are derived, and they are a major and critical component of the hydrological cycle which keeps us supplied with water. Protecting wetland ecosystems is as essential to people’s survival as is wise utilisation of the water and water-related benefits that wetland ecosystems provide.
10. While the Ramsar Convention does not directly address all of the components of the hydrological cycle (such as atmospheric, terrestrial and marine), the Convention’s scope certainly includes those components (surface and subterranean aquatic ecosystems) that are most important for ensuring water for people. Since its establishment in 1971, the Ramsar Convention has provided an array of practical tools and guidance that are intended to support the protection and wise use of wetland ecosystems, and through this to underpin the protection and wise use of water resources.
11. The key message here is: *“No wetlands, no water”*.

1.3 Why do wetland managers need to be involved in water management?

12. In order to maintain a desired level of ecological health and function, wetlands require sufficient water of adequate quality, at the right time and in the right pattern. This means that the water requirements of

Additional Information

The Changwon Declaration on human well-being and wetlands

The Changwon Declaration is a statement and call to action, adopted by the Contracting Parties to the Ramsar Convention at their 10th conference (COP10) held in Changwon, Republic of Korea, in 2008, as the Annex to Resolution X.3. It presents an overview of priority action steps that together show “how to” deliver some of the world’s most critical environmental sustainability goals. This includes a section on “water and wetlands”, from which the following text is taken. The Declaration states:

“The degradation and loss of wetlands is more rapid than that of other ecosystems, and this trend is accelerating, due to major changes in land use, water diversions, and infrastructure development. Access to freshwater is declining for 1-2 billion people worldwide, and this in turn negatively affects food production, human health, and economic development, and it can increase societal conflict.

There is an urgent need to improve water governance. Instead of being demand-driven, which promotes over-allocation of water, water governance should treat wetlands as our “*natural water infrastructure*”, integral to water resource management at the scale of river basins. **Continuing with “business as usual” is not an option.**

Our increasing demand for, and over-use of, water jeopardizes human well-being and the environment. Access to safe water, human health, food production, economic development and geopolitical stability are made less secure by the degradation of wetlands driven by the rapidly widening gap between water demand and supply.

There is often not enough water to meet our direct human needs and to maintain the wetlands we need. Even with current attempts to maintain water flows for ecosystems, the capacity of wetlands to continue to deliver benefits to people and biodiversity, including clean and reliable water supplies, is declining. Actions to support water allocation to ecosystems, such as environmental flows, placing upper limits on water allocations (water ‘caps’), and new water management legislation, must be strengthened.

To close this “water gap”, we need to:

- use our available water more efficiently;
- **stop our wetlands from becoming degraded or lost** – based on clearly recognizing that we all depend on healthy wetlands for our water security, and that wetland services are currently being lost at a faster rate than in any other ecosystem;
- **restore our wetlands that are already degraded** – this offers us an efficient and cost-effective means of increasing ground and surface water storage, improving water quality, sustaining agriculture and fisheries, and protecting biodiversity.
- **wisely manage and protect our wetlands** – by always ensuring that they have enough water for them to continue to be the source of the quantity and quality of the water we need for food production, drinking water and sanitation. Failure to do so makes our water problems worse, **since wetlands are the only source of water to which we have easy access.**”

wetlands, whether these requirements are to be met from surface runoff or groundwater, must be taken into account in any plan for abstraction of water from a river basin or discharge of water or waste into a river basin.

13. Water users may have water requirements that conflict with those of wetlands; alternatively, water users' needs may be dependent on the maintenance of wetland ecological character. There may be opportunities for achieving significant ecological, social and economic benefits as a result of negotiating tradeoffs and different ways of sharing the benefits of water (including ecosystem services), rather than sharing just the water itself.
14. If the needs of wetlands are to be adequately integrated into water resources management planning and implementation, then wetland managers must enter the "water debate" and get involved, through cooperative planning and management processes, in water allocation and water management decision-making.

2. Ramsar's suite of resolutions and guidance in relation to the hydrological cycle

15. The Ramsar Convention has always recognised the interdependence between people, water resources and wetland ecosystems. The preambular text of the Convention refers to "the fundamental ecological functions of wetlands as regulators of water regimes". Article 2 of the Convention text states that "international significance in . . . hydrology" is one of the criteria on which wetlands should be selected for the List of Wetlands of International Importance (Ramsar Sites).
16. The Convention has addressed water issues indirectly since its establishment in 1971, primarily through resolutions and guidance related to maintaining the ecological character of wetlands. However, until COP6 in 1996, water for maintaining wetland ecosystem functions and ecological character was treated as an external factor, seen as beyond the scope of the Convention and generally outside the control or influence of wetland managers.
17. The adoption of Resolution VI.23 *Ramsar and Water* by the Contracting Parties at COP6 in 1996 marked a significant step forward, for the first time making explicit the recognition that:
 - a) water resources management is dependent to a large degree on the hydrological functions of wetlands; and
 - b) wetland ecosystems need a certain amount of water allocated for maintenance of ecological character, in order to maintain these hydrological functions.
18. In order to support the development of policy and practice for implementing this perspective, the Ramsar Convention needed to become "an audible voice in water debates" at community level, at national level and at global level. To ensure that Ramsar's voice is not only audible, but practical, realistic and based on sound science, a growing suite of guidance related specifically to water issues has been adopted by the Contracting Parties and is planned for the future.

19. However, it is worth noting that almost all of Ramsar's resolutions and guidance have addressed water issues in some way, whether directly, indirectly or peripherally, since wetlands and water cannot be separated. The major cross-linkages are indicated in section 6 of this document, which provides a framework for the relationships amongst the various sets of guidance.
20. It is important to note that Ramsar's water-related guidance is not intended to lead or drive the formulation and implementation of core water sector policy regarding water benefits/services and water resources management. Rather, the intention is to provide guidance primarily for agencies and organisations responsible for management of wetland ecosystems, but in the context of the "water debate".
21. Such guidance should promote improved understanding of water sector issues by the wetlands sector, and *vice versa*, and should support collaboration between the water and wetlands sectors.
22. The goal of improved understanding and collaboration between the two sectors should be twofold: protection and wise use of wetland ecosystems, as well as protection and maintenance of a range of ecosystem-dependent benefits/services from water resources.
23. Ramsar's scope and mandate does not include all components of the hydrological cycle (i.e., atmospheric, terrestrial, aquatic, subterranean and marine), being limited to aquatic, subterranean and coastal marine wetland ecosystems. However, Ramsar's water-related guidance does need to take cognisance of, and ensure integration with, other conventions, frameworks, initiatives and activities that affect the hydrological cycle in some way.

3. Water in the environment

3.1 The hydrological cycle supports and links all components of the environment

24. The broader biophysical environment is composed of the marine environment, the terrestrial environment (which includes the unsaturated zone of the soil horizon), the aquatic environment, the subterranean environment (which includes aquifers, cave systems, and the saturated zone of the soil horizon) and the atmospheric environment.
25. The hydrological cycle (Figure 1) links all these components of the broader environment, and this means that water resources are linked, via the water itself, to all the other components of the broader environment (such as soil, biota, vegetation, air).
26. Water itself appears in various forms in the environment, reflecting the different phases of the hydrological cycle:
 - In atmospheric ecosystems, water is generally found in the vapour or liquid form, or may occur temporarily in the solid form as hail or snow.
 - In terrestrial ecosystems, water may be found in vegetation and/or the unsaturated zone of the soil horizon and be part of the evapo-

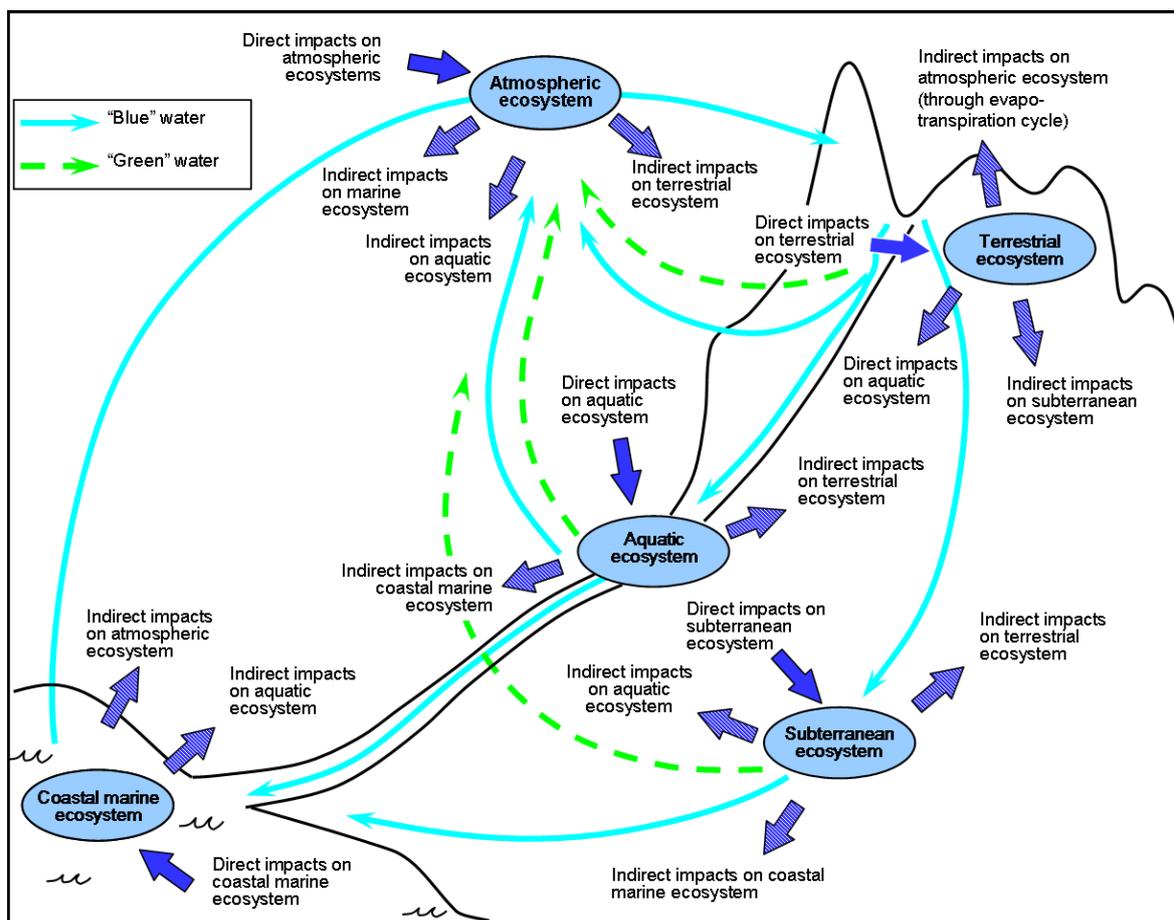


Figure 1: Phases of the Hydrological Cycle, showing the inter-relationships between environmental components and the so-called "blue" and "green" water components of the hydrological cycle, where "blue water" refers to all water that is controlled by physical processes and "green water" is the water that is influenced by biological processes such as evapo-transpiration by vegetation. Note that aquatic ecosystems include all surface water aquatic systems, i.e. riverine, palustrine, marsh and estuarine ecosystems as well as subterranean systems.

From WRC (2004). Investment Strategy for the Crosscutting Domain: Water and the Environment. Water Research Commission Report No. KV148/04. Pretoria, South Africa. 12pp + appendices. Also available at www.wrc.org.za

transpiration cycle – the term "green water" has been recently adopted to describe water in this aspect¹.

- Water in aquatic, marine and subterranean ecosystems appears in its liquid form, where it is usually termed "blue water" – this includes water held in aquifers, or in the saturated zone of the soil horizon. In the context of this background paper, aquatic ecosystems are those in which water is generally fresh or brackish (but may include hypersaline inland systems). Coastal marine ecosystems include the estuarine and nearshore marine aspects of water, while the offshore marine ecosystem's primary influence on the hydrological cycle is through global, continental and regional weather patterns.

1 Falkenmark, M. (1999). Competing freshwater and ecological services in the river basin perspective - an expanded conceptual framework. In: *Proceedings of the SIWI/IWRA Seminar "Towards Upstream/Downstream Hydrosolidarity"*. Swedish International Water Institute, Stockholm.

- Water as ice tends to be common to terrestrial and aquatic ecosystems, and when held in glaciers and ice sheets forms a kind of bridge between terrestrial and aquatic ecosystems.

3.2 The hydrological cycle is regulated by ecological processes

27. There are biophysical, biochemical and ecological links within and between each of the components comprising the hydrological cycle. Ecological processes play a critical role in regulating the hydrological cycle, and they are themselves affected by biophysical and biochemical processes occurring within the hydrological cycle. Here, the structural, functional and compositional aspects of biodiversity play a variety of roles, at several different scales, in governing linkages within and between the components of the hydrological cycle. In addition, ecological functions and processes occurring within the hydrological cycle both affect the humans who are part of the associated social system, and are affected by human activities.

3.3 Changes in the broader environment affect water

28. Water in the hydrological cycle is also affected by natural and human-induced processes of change to land, water and wetlands. These can be due to changes in the topography and morphology of the landscape, which primarily affect the “blue water” component of the hydrological cycle, or due to changes in vegetation and land cover, which primarily impact on “green water” through affecting infiltration and evapotranspiration rates and patterns.
29. Changes in land and water environments affect the rates and pathways by which water moves within the hydrological cycle, and also affect the quality of the water in its various forms and places.

3.4 Impacts on ecosystems in one part of the hydrological cycle can be propagated to others - often with unforeseen results

30. The point of the rather simplistic breakdown in Figure 1 of the hydrological cycle into different components (atmospheric, marine, aquatic, terrestrial, and subterranean) is that a disturbance or perturbation in one component of the hydrological cycle, whether natural or as a result of a direct human-induced impact, can be propagated via indirect impacts to terrestrial, aquatic and marine components. Figure 1 indicates this, without showing the real-life complexity of feedback loops and higher-order effects.
31. The connections between the hydrological cycle and the broader environment are bi-directional, in that direct impacts on the non-water aspect of the environment can affect water, while direct impacts on water (such as abstraction or waste discharge) can affect the broader environment as well.

4. Water resources management in the context of the hydrological cycle

4.1 Water: an integral part of ecosystems

32. In most countries, the conventional water sector deals with water primarily as a commodity. From this point of view, water, while it may be provided by and is integral to an ecosystem, is usually delivered to people through some kind of infrastructure such as dams, pumps and pipes. The water is often utilised for agricultural production, industrial production, energy production or human consumption outside the ecosystem from which it was derived.
33. The problem with the conventional approach to management of water as a commodity is that many of the values which humans place on water, aside from just having an adequate supply when they turn on a tap, are dependent on that water being a component of a healthy, functional ecosystem. Thus better connections need to be made between water supply and the water resources which are the origin of that supply.

4.2 Sufficient and reliable supplies of good quality water depend on healthy, functioning ecosystems

34. In addition to water supply for offstream use, humans have many uses for water as an integral part of ecosystems. These include maintenance of a supply of food, fibre and timber products, transport, recreation, support of cultural and spiritual practices, purification and removal of some kinds of wastes.
35. Ecosystems, particularly those in which water is a critical component or the main component, are resilient and can withstand a certain degree of impact, including abstraction of water, abstraction of food and fibre resources, discharge of waste or modification of the biophysical and biochemical template.
36. However, such disturbances have finite limits. Exceeding these limits changes the structure and function of an ecosystem irreversibly, leading to irreparable changes in the range, availability and quality of the benefits/services which the ecosystem formerly provided, such as a predictable supply of water of good quality, or a certain stock of fish resources.
37. Such changes in ecosystem benefits/services can be irreversible and very challenging to manage.
38. Given that wetlands also depend on water, information is required on the quantity and quality of water necessary to sustain the ecological functioning of the wetland.

4.3 Water resources management needs cross-sectoral policy, governance and institutional processes

39. Human activities impact ecosystems at different places in the hydrological cycle, and thus impact water itself. Hence the water sector needs to manage water resources in the context of ecosystem management, in order to sustain the benefits/services of water for both instream and offstream uses.
40. From both government and governance points of view, this requires either removal of the artificial boundaries between the environment sector, the water sector and other relevant sectors, or very close cooperation between environment, water and related sectors. This is where the issue

of cooperative governance becomes so important: the responsible agencies must share common objectives for the management of water throughout the hydrological cycle, and must act accordingly; otherwise, their interventions will, at best, be less effective than they could, and at worst, may even be in conflict.

41. These common objectives should be largely defined by the people and societies dependent on the water resources, which requires that governance of water resources be underpinned by institutional structures and processes which ensure that the voice of civil society is integral to planning and decision-making on water issues.

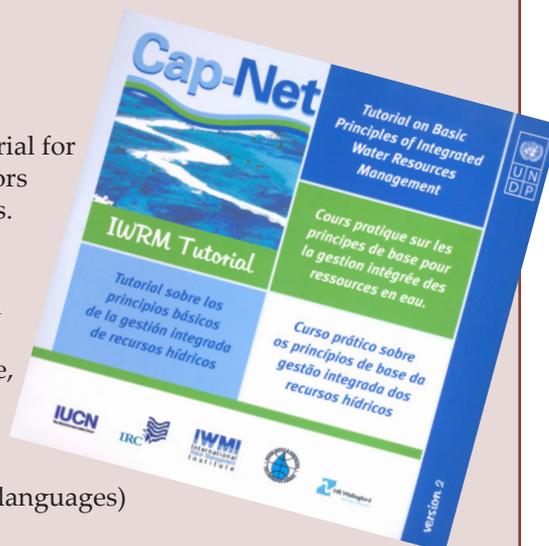
4.4 Ramsar's role in integrated water resources management

42. The initial focus of the Ramsar Convention was perceived to be, as its full original title indicates, on protecting "wetlands of international importance especially as waterfowl habitat". However, the Convention already recognised, in its original text, the "interdependence of Man and his environment . . . the fundamental ecological functions of wetlands as regulators of water regimes", and that "wetlands constitute a resource of great economic, cultural, scientific and recreational value".
43. Over time, the role and scope of the Ramsar Convention has evolved, building on this recognition of the fundamental linkages between human well-being, wetland ecosystem functions and water. This is reflected in the provision, through the Convention, of a rich array of knowledge and guidance related to the principle of "wise use" of wetlands, and also in the more recent initiatives (since COP6 in 1996) to move beyond viewing a few individual wetlands on the Ramsar List as self-contained ecological units, towards a view that all wetlands, wherever they occur in the hydrological cycle at planetary, continental, supranational and basin scales, ultimately are important and have a role to play in regulation of the hydrological cycle and provision of benefits to human society.
44. This approach is being widely promulgated in the Commission for Sustainable Development, as an underpinning aspect of Integrated Water Resources Management (IWRM), of which river basin management (RBM) is a primary component. In addition, IWRM [was] a target of the Johannesburg Plan of Implementation (paragraph 25) adopted at the 2002 World Summit on Sustainable Development, to "develop integrated water resources management and water efficiency plans by 2005".
45. In principle, IWRM is an approach wherein a balance is sought between protection of the resource base for long-term sustainability on the one hand and, on the other hand, utilisation of the benefits/services provided by the resource base in order to meet short- to medium-term social and economic development imperatives.
46. In the IWRM approach, it is accepted that the benefits of utilisation of water resources are not limited just to abstraction of water for offstream use, but include many other benefits/services that are dependent on healthy, functional aquatic ecosystems. These aquatic ecosystems need to be supported within a hydrological cycle whose other component ecosystems (atmospheric, terrestrial and marine) are also healthy and functional. Thus

Additional information

Cap-Net – communicating IWRM

What is IWRM? Cap-Net, an international network for capacity building in Integrated Water Resources Management (IWRM), has developed an online tutorial for policy makers, water managers, trainers and educators who want a basic understanding of IWRM principles. Each screen presents users with just the basic facts for understanding of the issue but also offers the opportunity, at the click of a button, to read more. In addition, users can access more information about what IWRM means for the Environment, Agriculture, and Water Supply and Sanitation sectors. All of this material is well illustrated. The online tutorial [can be accessed] here [www.archive.cap-net.org/iwrmtutorial/mainmenu.htm], or downloaded (in several languages) here: www.cap-net.org/node/1519].



This tutorial is also available, free of charge, on CD in English, French, Spanish and Portuguese by emailing info@cap-net.org. Since the materials have been prepared in PowerPoint, they can be modified to reflect local circumstances and there are instructions on the CD on how to make such changes. This format also presents the opportunity to translate the materials into other languages.

Cap-Net is a partnership of autonomous international, regional and national institutions and networks committed to capacity building in the water sector. Many regional and country networks have been established for scaling up delivery of capacity building on IWRM and bringing together experienced educators, trainers and researchers in water related fields. Their Web site provides information on these networks and offers a wide-range of resource materials on training courses, water management tools, and network management tools.

To learn about Cap-Net, visit their Web site at <http://www.cap-net.org>.

IWRM should be seamlessly connected to approaches and initiatives for planning and management in the atmospheric, terrestrial and marine components.

47. At the freshwater-marine interface, this means dovetailing IWRM approaches with Integrated Coastal Zone Management (ICZM) to ensure that coastal wetlands are managed and used in ways that recognise their importance as a critical link in the hydrological cycle.
48. Coastal wetlands are an especially important component of the hydrological cycle, since both marine and freshwater ecosystems are often dependent on the health and ecological character of coastal ecosystems.
49. Protection of wetland ecosystems and their benefits/services is essential to ensuring the sustainability of utilisation of water resources for human benefits. An IWRM approach recognises the importance of achieving the difficult and dynamic balance between protection and utilisation. Water resource protection strategies and water resource utilisation strategies are

See also Handbook
12, Coastal
management

interdependent, and need to be equally effective and efficient in order to optimise and sustain benefits/services.

50. The Ramsar Convention provides a range of mechanisms and technical guidance aimed at the effective maintenance of functional wetland ecosystems, thus contributing a valuable foundation for the ecological side of the IWRM balance

4.5 Principles for development and implementation of Ramsar's water-related guidance

51. A set of seven principles was set out in the guidance annexed to Resolution VIII.1 on water allocation and management for maintaining the ecological functions of wetlands. These principles have been defined not only through analysis of previous policy documents adopted by the Ramsar Convention, but also by reference to IWRM principles developed by other international organizations and initiatives.
52. These principles are applicable to the full suite of Ramsar's water-related guidance, and are set out in Box 1.

Box 1: Principles for development and implementation of Ramsar's water-related guidance

Sustainability as a goal. Adequate water has to be provided to wetlands to sustain the functioning of these ecosystems, respecting their natural dynamics for the benefit of future generations.

Clarity of process. The process by which decisions are made on the allocation and management of water and wetlands should be clear to all stakeholders.

Equity in participation and decision-making factors. There should be equity for different stakeholders in their participation in water allocation and water management decisions related to wetlands.

Credibility of science. Scientific methods used to support water allocation and water management decisions related to wetlands should be credible and supported by review from the scientific community.

Transparency in implementation. Once procedures for water allocation and water management decisions related to wetlands have been defined and agreed, it is important that they be seen to be implemented correctly.

Flexibility of management. Like many ecosystems, wetlands are characterized by complexity, changing conditions, and uncertainty. It is essential that an adaptive management strategy be adopted, which requires plans that can be changed as new information or understanding comes to light.

Accountability for decisions. Decision-makers should be accountable.

5. A framework for Ramsar's water-related guidance

See Handbook 1, *Wise use of wetlands*

53. Almost all Ramsar's adopted guidance fits comfortably into the overarching framework of the wise use of wetlands, one of the three main pillars of the Convention (see also Resolution IX.1 Annex A *A Conceptual Framework for the wise use of wetlands and the maintenance of their ecological character*).
54. The overall suite of Ramsar's technical guidance can be rather simplistically divided into 1) core water-related guidance and 2) other Ramsar guidance relevant to water or containing water-related provisions. (Although this approach takes a very "water-centric" view of Ramsar, it is not intended that this view should in any way detract from the individual and collective importance of all the various available technical guidance documents and their purposes.)
55. The suite of water-related guidance addresses three main themes:
 - i) **scientific and technical tools** needed to assist in management of those aspects of wetland ecosystems directly related to water (including indigenous knowledge systems);
 - ii) **policy, governance and institutional** aspects of water management, since these factors generally determine and influence the nature of people's interactions with water where it is found in wetland ecosystems; and
 - iii) integrating frameworks, such as **planning and management** frameworks at various scales from regional through river basin to local catchment level, that promote the integration of human society's needs, values and aspirations into processes which utilise the best available knowledge to support the wise use of wetlands and hence the sustainability of water resources.
56. These three themes are also addressed to a lesser degree, or indirectly, in several other Ramsar guidance documents that address wider wetland issues and that mention water. For example, the hydrological regime of a wetland is part of the definition of the wetland's ecological character, hence guidance related to ecological character has several relevant references to water-related aspects of wetlands. [See guidance annexed to Resolution X.15, *Describing the ecological character of wetlands, and data needs and formats for core inventory: harmonized scientific and technical guidance*].
57. Box 2 shows the core water-related guidance documents currently available, including those guidances adopted by COP9 [and COP10]. [It also shows those being prepared by the STRP as Ramsar Technical Reports, and those identified as gaps in the current suite of guidance and [...] as priorities for future STRP work.]

6. Ramsar resolutions and guidance related directly to water

58. The proposed full suite of water-related guidance is presented diagrammatically in Figure 2a. The set of currently available water-related guidance (blue boxes in Figures 2a and 2b) has notable gaps, as the STRP programme of work in this field has been very much determined by the

Box 2: Development of Ramsar's suite of specific water-related guidance

COP Resolutions and guidance already adopted

Several resolutions and guidance related specifically to water management have already been adopted, that build on the vision of *Resolution VI.23: Ramsar and Water* (Brisbane, 1996). These are:

- *Resolution VII.18: River basin management* (COP7, San Jose, 1999) [Now superseded]
- *Resolution VIII.1: Allocation and management of water* (COP8, Valencia, 2002)
- *Resolution VIII.2: World Commission on Dams* (COP8, Valencia, 2002)
- *Resolution VIII.40: Use of groundwater and wetland conservation* (COP8, Valencia, 2002)[...]
- *Resolution IX.1 Annex C: A framework for Ramsar's water-related guidance* (COP9, Kampala, 2005)
- *Resolution IX.1 Annex Ci: River Basin Management: Additional guidance and a Framework for the analysis of case studies* (COP9, Kampala, 2005) [...] [Now superseded]
- *Resolution IX.1 Annex Cii: Guidelines for the management of groundwater to maintain wetland ecological character* (COP9, Kampala, 2005)
- [Resolution X.19: *Wetlands and river basin management: consolidated scientific and technical guidance* (COP10, Changwon, 2008)]

Detailed technical guidance [planned or proposed for publication] as Ramsar Technical Reports

- *Determination of environmental water requirements for estuaries, coastal and near-shore wetlands*
- *Determination of environmental water requirements for rivers*
- *Environmental flow determination and implementation*
- *Wetlands and water quality management*
- *Water resources management in dry and sub-humid lands*
- *River basin management: critical path application case studies*

[Other] guidance [...] for future development by the STRP

Other water-related issues considered by the STRP [and the COP] to be important for attention in the [2009-2012] triennium (see [e.g.,] Resolution [X.10] Annexes 1 and 2), [in addition to those listed above], are: [...]

- *Wetlands and water storage interactions*
- *Implementation of river basin management plans - review*
- *Determination of environmental water requirements for non-river inland wetlands*
- *Integrated water and coastal management - case studies*
- *Ramsar water and wetlands Resolutions - review of consolidation options*
- *Strategy for mainstreaming natural wetland infrastructure into Integrated Water Resources Management*
- *Strategy for engaging in the global water debate*

Further possible guidance [work which may be addressed in future], depending on priorities and resources

- *Preparation of a single, integrated Handbook which brings together all Ramsar's core water-related guidance*
- *Detailed guidance on managing water-related aspects of wetlands under conditions of climate change and desertification*
- *Additional guidance on cross-sectoral policy and legislation (including all the water use sectors) for addressing water-related aspects of wetland management*

availability of resources and funds to undertake priority tasks. Some of the gaps will be addressed by new guidance to be tabled at [future COPs or issued as Ramsar Technical Reports] [...]. Possible future priorities for STRP attention (orange boxes), that should fill the major gaps in the suite of water-related guidance, are also indicated in Figures 2a and 2b.

59. The water-related guidance should also be consistent with the rest of Ramsar's technical guidance materials, and Figure 2b indicates where water is currently addressed indirectly in other guidance documents, and where other guidance documents may need to be updated or revised to ensure consistency in the way in which water issues are addressed within the full suite of Ramsar guidance.

6.1 Brief descriptions of water-related resolutions and guidance documents

60. Resolutions and Recommendations adopted previously, along with the supporting technical guidance materials, are briefly described below. [...] Possible future guidance still to be developed [is] also indicated in Figures 2a and 2b. It is envisaged that this list will be regularly updated as new resolutions and guidance are adopted and made available to the Contracting Parties.

A. Strategic resolutions and guidance

61. Current strategic resolutions and guidance [...] are:

- *Resolution VI.23: Ramsar and water* (Brisbane, 1996), which addresses the need for collaboration between the water sector and the wetland conservation and management sector, notably through promoting integration of conservation and wise use of wetlands into decision-making on land use, groundwater management, catchment/river basin and coastal zone planning. This Resolution identified the reconciliation of water management and wetland conservation as a key challenge for the Ramsar Convention in the 21st Century. Efforts to develop and expand Ramsar's water-related guidance all derive from Resolution VI.23.
- [*Resolution X.19: Wetlands and river basin management: consolidated scientific and technical guidance* (Changwon, 2008) updated and superseded Resolution VII.18's guidance on integrating wetland conservation and wise use into river basin management, which had followed on from Resolution VI.23]. The Annex to this resolution provides guidance related to various relevant components of river basin management, including institutional arrangements, policy and legislation, basin-level assessments, water resources planning, maintenance of natural water regimes, and land use management. This is a key resolution in the suite of water-related guidance, and it is suggested that more detailed operational guidance on a number of its individual components should be developed in the future (see Figures 2a and 2b).
- *Resolution VIII.4: Principles and guidelines for incorporating wetland issues into Integrated Coastal Zone Management (ICZM)* (Valencia, 2002),

Incorporated in
Handbook 9

Incorporated in
Handbook 12

which consolidates previous resolutions and recommendations related to intertidal wetlands, coral reefs and associated ecosystems, coastal zone management and mangrove ecosystems. The guidance annexed to this Resolution includes a set of principles and guidelines for ensuring that the values, functions and roles of coastal wetlands are recognised, quantified where possible, and fully integrated into coastal zone management. Aspects covered in the guidance include planning processes, legal and institutional frameworks, stakeholder participation, and the linkages between coastal wetlands and river basin management on the one hand, as well as oceans and fisheries management on the other.

- *Resolution VIII.35: The impact of natural disasters, particularly drought, on wetland ecosystems* (Valencia, 2002), which addresses the need for planning and providing water for wetland ecosystems in times of drought and other natural disasters, to ensure that these ecosystems continue to provide values and functions for people and biological diversity. Protocols for allocating water to wetland ecosystems in drought conditions are essential elements of river basin planning and operations. COP9 adopted a further Resolution (Resolution IX.9) on “The role of the Ramsar Convention in the prevention and mitigation of impacts associated with natural phenomena, including those induced or exacerbated by human activities.”
- *Resolution VIII.34: Agriculture, wetlands and water resource management* (Valencia, 2002), which highlights the interdependencies between agricultural activities and the wise use of wetlands and notes the need to balance potential benefits and impacts of one on the other, within an integrated catchment planning approach. This is equally true of other land use activities, but generally agriculture is the most significant activity of those directly linked to wetland ecosystems. COP9 adopted a similar Resolution (Resolution IX.4) on the interdependencies between the wise use of wetlands and the conservation and sustainable use of fish resources.
- *An Integrated Framework for the Ramsar Convention’s water-related guidance* (this document, adopted by COP9 as Resolution IX.1 Annex C).
- [*Resolution X.3: The Changwon Declaration on human well-being and wetlands* (Changwon, 2008), which is a statement and call to action, presenting priority action steps for delivering some of the world’s most critical environmental sustainability goals. It emphasises the urgent need to improve water governance, support water allocation to ecosystems, use water more efficiently and protect the “natural infrastructure” of wetlands as water sources.]

B. Scientific and technical tools

62. Current scientific and technical tools in the Ramsar ‘toolkit’ [...] are:

- *Resolution VIII.1: Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands* (Valencia, 2002), which deals very specifically, in its Annex and the supporting Technical Paper, with the determination of water requirements for maintenance

of wetland ecosystems, and addresses the allocation of water for this purpose. Implementation (for example, design of operating rules for environmental water releases from dams) is not addressed in detail, but is the subject of additional guidance [being prepared for publication in the Ramsar Technical Reports series]. Although the emphasis is on determination, allocation and management of water for wetland ecosystems, this cannot be achieved without also addressing the necessary supporting institutional arrangements, policy and legislation, and decision-making frameworks, and so the guidance includes some discussion of these supporting factors.

Incorporated in
Handbook 11

- *Resolution VIII.40: Guidelines for rendering the use of groundwater compatible with the conservation of wetlands* (Valencia, 2002), which recognises the often critical hydrological and ecological linkages between groundwater bodies and wetland ecosystems, and highlights the impacts that groundwater exploitation and use can have on wetlands. This Resolution led to the development of the guidelines on groundwater management which were adopted by COP9 (Resolution IX.1 Annex C.ii). [...]
- *Resolution VIII.2: Report of the World Commission on Dams (WCD) and its relevance to the Ramsar Convention* (Valencia 2002), which addresses the role of dams, both positive and negative, in water management and wise use of wetlands; highlights the need for integrated water resources planning frameworks that balance the commissioning and operation of dams with wise use of wetlands; notes the report of the World Commission on Dams as a valuable source of technical guidance and “advisory tools” to support decision-making related to large dams. These tools are seen as complementary to Ramsar’s current suite of water-related guidance, contributing a component of the guidance that is specifically focused on dams.

C. Policy, governance and institutional aspects

63. Current [Resolutions and] guidance [...] on policy, governance and institutional aspects of wetlands and water are:

Incorporated in
Handbook 9

- [Resolution X.19: *Wetlands and river basin management: consolidated scientific and technical guidance* (Changwon, 2008) superseded Resolution VII.18 as] the primary source of guidance on relevant policy, governance and institutional aspects of water resources management, providing an overall framework for addressing these aspects. Additional operational detail may be required in future (see Figure 2a) on options for the content of revised water sector policy and legislation to support determination and implementation particularly of water allocations for wetland ecosystems.

Incorporated in
Handbook 10

- *Resolution VIII.1: Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands* (Valencia, 2002) and its supporting technical paper, which provide guidance on policy, legislation and institutional arrangements specifically related to determination and allocation of water for maintaining wetland ecosystems. Additional detail on options for policy and legislation related to water entitlements may be required in future (see Figures 2a

and 2b), and could be integrated into a revised version of the current guidance contained in the Annex to Resolution VII.7 on reviewing laws and institutions, or could be a stand-alone element of the water-related guidance suite.

Incorporated in
Handbook 3

- *Resolution VII.7: Guidelines for reviewing laws and institutions to promote the conservation and wise use of wetlands* (San José, 1999), which provides guidance on processes for review of legislation and institutional arrangements. While the focus is on legal and institutional provisions for general wetland conservation and management, the processes described in the guidance annexed to this resolution are quite generic and provide a valuable template for similar processes to review laws and institutions in the water sector, thus complementing Resolutions [such as VIII.1, the Annex to which provides information on issues which should feature in water-related laws and institutions].

Incorporated in
Handbook 2

- *Resolution VII.6: Guidelines for developing and implementing National Wetland Policies* (San José, 1999), which deals with the development of wetland policy and does not address water sector policy in any detail. However, the advice related to the policy development process, described in the guidance annexed to this Resolution, could provide useful pointers for review of water sector policy in order to better integrate the protection, conservation, management and wise use of wetlands. Additional detail on appropriate wetland-specific content of water sector policy may be required in the future (see Figures 2a and 2b).
- [Resolution IX.3: *Engagement of the Ramsar Convention on Wetlands in ongoing multilateral processes dealing with water* (Kampala, 2005), which describes the relevance of the wetlands and water agenda to the objectives of bodies such as the World Water Forum and the UN Commission on Sustainable Development. Several suggestions are made concerning better integration with integrated planning frameworks and with poverty reduction goals; and important linkages with other multilateral processes are identified.]

D. Basin planning and management frameworks

64. Current planning and management frameworks for the basin scale [...] are:

Incorporated in
Handbook 9

- [*Resolution X.19: Wetlands and river basin management: consolidated scientific and technical guidance* (Changwon, 2008), which superseded and replaced two earlier Resolutions. *Resolution VII.18: Guidelines for integrating wetland conservation and wise use into river basin management* and its Annex had previously been the key documents related to planning frameworks at river basin level, together with *Resolution IX.1 Annex Ci* which gave additional guidance on the integration of wetland conservation and management into river basin management planning and decision-making. The consolidated guidance includes a focus on the sequencing of issues and activities according to a “Critical Path” model, which is also presented as a template for the collation and use of case studies of river basin management.] [...]

Incorporated in
Handbooks 17 and
18

- Less detailed guidance on river basin management, related specifically to water allocations for wetlands, is contained in the Annex to Resolution VIII.1. Similarly, some guidance on river basin planning and strategic environmental assessment related to dams and water resources is to be found in the report of the World Commission on Dams, which is the subject of Resolution VIII.2.
- *Ramsar Wise Use Handbook [17 (4th edition)]*: *Designating Ramsar Sites* contains references to identification of hydrological functions of wetlands and linkages of wetlands with surface and groundwater resources, a necessary task in planning at river basin level as well as at site level. Likewise *Ramsar Wise Use Handbook [18 (4th edition)]*: *Managing wetlands* contains brief guidance related to integration of wetland management planning with river basin management planning, though like Handbook [17], its primary focus is at site or sub-basin level.

7. Ongoing development of the framework for water-related guidance

65. The integrated framework described in this document is intended to provide, when fully developed, a “road-map” of the various elements of Ramsar’s suite of water-related guidance, and to indicate linkages between water-related guidance and other Ramsar guidance related to protection, management and wise use of wetland ecosystems. Detailed technical appendices would be added to the set over time, and individual appendices might be replaced by updated or more detailed versions as new knowledge and information becomes available. Identified gaps or areas in the suite requiring more detailed attention would be addressed in the STRP’s programme of work (see Resolution [X.10] Annexes 1 and 2).
66. It is envisaged that the framework (this document) should be updated regularly as additional resolutions and pieces of water-related guidance are prepared for adoption by the Contracting Parties, depending on the priority tasks taken up by the STRP in each triennium.

Figure 2a: Core water-related guidance in the Ramsar Handbooks series

[**Note to 4th edition:** Figures 2a and 2b below entirely replace the equivalent tables from the 3rd edition Handbook. They incorporate updated references to the Handbook series and to Resolutions adopted since COP9, and they take account of the considerable evolution that has taken place since then in the content of work plans for the Ramsar Scientific and Technical Review Panel, in the light of priorities expressed by Contracting Parties at COP9 and COP10].

Core water-related guidance	
Current guidance (Handbook numbers reflect the 4th edition)	Planned or proposed future guidance, and STRP tasks
<i>Scientific and technical guidance</i>	
Water allocations: management. Res VIII.1 + Annex, Handbook 10 (Section II).	Ramsar Technical Report: Determination of environmental water requirements for estuaries, coastal and near-shore wetlands Ramsar Technical Report: Determination of environmental water requirements for rivers. STRP task: Determination of environmental water requirements for non-river inland wetlands. Ramsar Technical Report: Environmental flow determination and implementation. Water allocations: worked examples and case studies of determination and implementation (all wetland types).
Reservoirs and human-made wetlands: downstream impacts addressed in WCD guidance. Res VIII.2.	STRP task: Wetlands and water storage interactions: guidance. Wise use within water resources management context, and human-made wetlands.
Groundwater management for maintaining wetland ecological character: general guidance. Res VIII.40, IX.1 Annex Ciii + Handbook 11.	Groundwater: initially planned to draft detailed technical and operational guidance for management of groundwater associated with wetlands. Groundwater issues now integrated into several STRP tasks.
	Ramsar Technical Report: Wetlands and water quality management. Management of water quality in wetland ecosystems; water quality requirements for protection of wetland ecosystems; management and mitigation of water quality impacts on wetlands.
	Ramsar Technical Report: Water resources management in dry and sub-humid lands.
<i>Policy, governance and institutional aspects</i>	
	STRP task: Ramsar water and wetlands Resolutions - review of consolidation options. Possible: Preparation of a single, integrated Handbook which brings together all Ramsar's core water-related guidance.

<p>Water allocations: law and policy aspects. Some guidance in Res VIII.1 and Handbook 10 Section II.</p>	<p>Possibly, either: Review and strengthen (including with some operational detail) specific water sector aspects of non-core guidance on law, policy and institutions (Handbooks 2 and 3); Or: Provide new core guidance on developing water sector policy that can adequately address dependencies between water management and wetland ecosystems. Could be integrated into a revised version of the current guidance contained in the Annex to Resolution VII.7 on reviewing laws and institutions, or could be a stand-alone element of the water-related guidance suite.</p>
<p>RBM guidance: law, policy and institutional aspects addressed in Res X.19 (Annex) and Handbook 9.</p>	<p>Possible: development of more detailed operational guidance on a number of the individual components of RBM.</p>
	<p>Possible STRP task: Strategy for engaging in the global water debate.</p>
<p><i>Planning frameworks</i></p>	
<p>Water allocations: Res VIII.1 (Annex) and Handbook 10 (Section I)</p>	<p>(See above)</p>
<p>RBM guidance. Res VI.23, Res X.19 and Handbook 9</p>	<p>Identification, analysis, tracking and reporting of RBM case studies Ramsar Technical Report: River basin management: critical path application case studies. STRP task: Implementation of river basin management plans - review.</p>
<p>Water resources development planning: WCD principles (Res VIII.2)</p>	<p>STRP task: Strategy for mainstreaming natural wetland infrastructure into Integrated Water Resources Management Possible: Detailed guidance on managing water-related aspects of wetlands under conditions of climate change and desertification. Implications of climate change for planning, water resources management and environmental flows. Possible: Additional guidance on cross-sectoral policy and legislation (including all the water use sectors) for addressing water-related aspects of wetland management.</p>
<p>Integrated Coastal Zone Management: Res VIII.4 and Handbook 12.</p>	<p>STRP task: Integrated water and coastal management - case studies.</p>

Figure 2b: Other Ramsar guidance containing relevant references to water

Other relevant Ramsar guidance	
Current guidance (Handbook numbers reflect the 4th edition)	Planned or proposed future guidance, and STRP tasks
<i>Scientific and technical guidance</i>	
Additional scientific and technical guidance for implementing the Ramsar wise use concept: Res IX.1 Annex A.	
Integrated framework for inventory, assessment & monitoring: Res IX.1 Annex E; and Handbook 13. Inventory framework. Res VIII.6, Res X15 and Handbook 15.	Ramsar Technical Report: Vulnerability Assessment.
Ecological character (water supply as a product) and assessing change in ecological character: Res VI.1, Res VIII.8, Res X.15, Res X.16.	STRP task: conceptual models on ecological character. STRP task: further work on change in ecological character, including limits of acceptable change.
Indicators of Convention effectiveness at river basin level: Res IX.1 Annex D.	Monitoring and evaluating water-related aspects of ecological character, including indicators of ecological character and wetland management at site level and at river basin level. Operationalising the indicators of effectiveness, and generating regular reports.
Designating Ramsar Sites, identifying wetland types and functions, especially hydrological functions. Handbook 17.	STRP tasks: rationalising the RIS, guidance on criteria and description of ecological character. Reviewing systems of wetland classification.
EIA guidance (river basin scale: biodiversity includes hydrology and limnology). Res X.17, Handbook 16.	
<i>Policy, governance and institutional aspects</i>	
Developing wetland policies: Rec 6.9, Res VII.6 and guidelines in Handbook 2.	Possible: additional guidance on developing water sector policy (to complement wetland policy) that can adequately address dependencies between water management and wetland ecosystems.
Disasters and drought: implications for water allocations. Res VIII.35 (Res IX.9 also relates to the same subject).	
Laws and institutions: Res VIII.7 and Handbook 3.	Potentially, in future, more specific guidance on water sector laws and institutions.
Participatory management and CEPA: Rec 6.3, Res VII.8, Res VIII.36, Res X.8 and Handbooks 6 and 7.	Further consideration of characterising and better targeting audiences for technical guidance, and further monitoring uptake, use and utility of guidance.

Engagement with multilateral processes dealing with water. Res IX.3.	
The Changwon Declaration, Res X.3: includes key messages on water security and governance.	
<i>Planning frameworks</i>	
Conceptual framework for wise use (Res IX.1 Annex A).	Updated wise use case studies.
Management of wetlands: some guidance on IRBM in Handbook 9.	
Strategic Environmental Assessment: integration of biodiversity into planning: Res X.17, Handbook 16.	
Coastal zone management: Rec 6.8, Res VII.21, Res VIII.4, Res VIII.32, Handbook 12.	STRP task: Integrated water and coastal management - case studies.
International cooperation (in shared river basins): Res VII.19, Handbook 20.	
Agriculture, wetlands and water resources management: Res VIII.34; and Res IX.4 on fisheries.	
Peatlands management: Res VIII.17.	
Climate change: implications of changes in hydrological cycle due to climate change: Res VIII.3, Res X.24.	Implications of climate change for planning, water resources management and environmental flows.

Relevant Resolution

Resolution IX.1

(adopted by the 9th meeting of the Conference of the Contracting Parties, Kampala, Uganda, 2005)

Additional scientific and technical guidance for implementing the Ramsar wise use concept

1. AWARE of the suite of technical and scientific guidelines and other materials prepared by the Scientific and Technical Review Panel (STRP) to support Contracting Parties in their implementation of wetland conservation and wise use;
2. NOTING that the 8th Meeting of the Conference of the Contracting Parties (COP8) instructed the STRP to prepare further advice and guidance for consideration by Contracting Parties at COP9 on topics including, *inter alia*, inventory and assessment, wise use, water resource management, Ramsar Site designation and management, and assessing the effectiveness of the implementation of the Convention;
3. THANKING the STRP for its work in preparing the advice and guidance annexed to this Resolution, as well as for the supporting technical reviews and reports being made available to Contracting Parties and others as *Ramsar Technical Reports*; and
4. ALSO THANKING the Government of Sweden and IUCN, WWF, the World Fish Centre, and the Water Research Commission (South Africa), which have provided financial support to the Panel and its Working Groups for the preparation of this advice and guidance and technical reports, and EXPRESSING GREAT APPRECIATION to the many organizations that have provided significant in-kind support to the work of the Panel;

THE CONFERENCE OF THE CONTRACTING PARTIES

5. APPROVES the *Conceptual Framework for the wise use of wetlands and the maintenance of their ecological character* (Annex A to this Resolution) and its updated definitions of “wise use” and “ecological character”, and CONFIRMS that these supersede all previous definitions of these terms;
6. ALSO APPROVES the revised *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Annex B to this Resolution), INSTRUCTS the Ramsar Secretariat to introduce these changes in the preparation of a new edition of Ramsar Wise Use Handbook 7, including revisions to the Information Sheet on Ramsar Wetlands (RIS), and URGES all Contracting Parties preparing a RIS for the designation of a new site for the Ramsar List and for updating the RIS for an existing site to submit the information to the Ramsar Secretariat in this revised format;
7. WELCOMES the frameworks, guidelines and other advice provided as annexes C, D, and E to this Resolution and URGES Contracting Parties to make good use of them as appropriate, adapting them as necessary to suit national conditions and circumstances and within the frameworks of existing regional initiatives and commitments and in the context of sustainable development;
8. URGES Contracting Parties to draw these frameworks, guidelines and other advice to the attention of all relevant stakeholders, including *inter alia* government ministries, departments and agencies, water and basin management authorities, non-governmental organizations, and civil society; and FURTHER URGES Contracting Parties to encourage these stakeholders to take these guidelines into account, together with those of the Ramsar ‘Toolkit’ of Wise Use

Handbooks 2nd edition, in their decision-making and activities which relate to the delivery of the wise use of wetlands through the maintenance of their ecological character; and

9. INSTRUCTS the Ramsar Secretariat to disseminate widely the frameworks and guidelines annexed to this Resolution, including through amendment and updating of the Ramsar 'Toolkit' of Wise Use Handbooks.



Modern wetland management at a flooded forest, Czech Republic, part of the Morava-Dyje floodplain. Originally, heavy sluices and dikes were constructed to prevent Dyje river floods from inundating the floodplain. However, it was later realised that regular flooding is necessary to sustain the ecosystem functioning of the riverine forests and meadows, producing important economic revenues through high quality timber production and big game hunting, as well as an outstanding harbour for biodiversity (with some of Europe's best old-growth hardwood forest reserves). Modern thinking changed the hydraulic interventions radically: sluices originally constructed to drain the floodplain area are now functioning the opposite way, retaining floods and providing dry polders with regular inundations.

The transboundary "Trilateral Ramsar Platform" of NGOs in Austria, Czech Republic, and Slovak Republic working for the Morava-Dyje floodplain received the Ramsar Wetland Conservation Award in 2002 for their innovative ideas and cooperative efforts with authorities in all three countries. *Photo: Tobias Salathé / Ramsar.*

The Ramsar Convention 'toolkit' for the conservation and wise use of wetlands, 4th ed. (2010)

Convention pillar 1: Wise Use

Handbook 1	Wise use of wetlands Concepts and approaches for the wise use of wetlands
Handbook 2	National Wetland Policies Developing and implementing National Wetland Policies
Handbook 3	Laws and institutions Reviewing laws and institutions to promote the conservation and wise use of wetlands
Handbook 4	Avian influenza and wetlands Guidance on control of and responses to highly pathogenic avian influenza
Handbook 5	Partnerships Key partnerships for implementation of the Ramsar Convention
Handbook 6	Wetland CEPA The Convention's Programme on communication, education, participation, and public awareness (CEPA) 2009-2015
Handbook 7	Participatory skills Establishing and strengthening local communities' and indigenous people's participation in the management of wetlands
Handbook 8	Water-related guidance An Integrated Framework for the Convention's water-related guidance
Handbook 9	River basin management Integrating wetland conservation and wise use into river basin management
Handbook 10	Water allocation and management Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands
Handbook 11	Managing groundwater Managing groundwater to maintain wetland ecological character
Handbook 12	Coastal management Wetland issues in Integrated Coastal Zone Management
Handbook 13	Inventory, assessment, and monitoring An Integrated Framework for wetland inventory, assessment, and monitoring
Handbook 14	Data and information needs A Framework for Ramsar data and information needs
Handbook 15	Wetland inventory A Ramsar framework for wetland inventory and ecological character description
Handbook 16	Impact assessment Guidelines on biodiversity-inclusive environmental impact assessment and strategic environmental assessment

Convention pillar 2: Ramsar sites designation and management

Handbook 17	Designating Ramsar Sites Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance
Handbook 18	Managing wetlands Frameworks for managing Ramsar Sites and other wetlands
Handbook 19	Addressing change in wetland ecological character

Convention pillar 3: International cooperation

Handbook 20	International cooperation Guidelines and other support for international cooperation under the Ramsar Convention on Wetlands
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Companion document

Handbook 21	The Ramsar Convention Strategic Plan 2009-2015 Goals, strategies, and expectations for the Ramsar Convention's implementation for the period 2009 to 2015
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Ramsar
Handbooks
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Handbook 8

Water-related guidance



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