



Delft University of Technology

## Recommendations and guidelines on sustainable river basin management

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**Publication date**

1999

**Document Version**

Final published version

**Citation (APA)**

Mostert, E. (Ed.) (1999). *Recommendations and guidelines on sustainable river basin management*. Delft University of Technology.

**Important note**

To cite this publication, please use the final published version (if applicable).

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# RECOMMENDATIONS AND GUIDELINES ON SUSTAINABLE RIVER BASIN MANAGEMENT

Workshop Report

“International Workshop on River Basin Management”  
The Hague, 27-29 October 1999

Organised by:



Sponsored by:



Ministry of Housing,  
Spatial Planning and the Environment



Ministry of Transport, Public Works and Water Management

## INTRODUCTION

From 27-29 October 1999 the International Workshop on River Basin Management was held in The Hague. The main purpose of this workshop was to contribute to the preparations of the Ministerial Conference that will be held in The Hague on 21-22 March 2000 parallel to the Second World Water Forum. River basin management will play an important role at this conference. Therefore it was seen opportune to bring together experts from all over the world, exchange experiences, and distil general "lessons" from these experiences.

This report contains the outcomes of the workshop: the "Recommendations and Guidelines on Sustainable River Basin Management" and a short key message. These outcomes were formulated by the participants in parallel and plenary sessions, and adopted in the final session. The annexes of this report contain the list of participants and the workshop programme. Proceedings including all keynote papers and several other contributions will be published separately.

The workshop was organised by the RBA Centre of the Delft University of Technology in co-operation with IHE Delft (International Institute for Infrastructural Hydraulics and Environmental Engineering), WL|Delft Hydraulics and the GLODIS Institute of the Erasmus University Rotterdam. The workshop was made possible through generous financial support by the Dutch Ministry of Housing, Spatial Planning and the Environment and the Dutch Ministry of Transport, Public Works and Water Management. The workshop forms the Dutch contribution to the International Hydrological Programme (IHP) of UNESCO, Project 4.1 *International Water Systems*.

From approximately 1 December onwards this workshop report can also be downloaded from Internet <http://www.ct.tudelft.nl/rba/rba.htm>

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## KEY MESSAGE

Sustainable river basin management requires proper study, sound understanding and effective management of water systems and their internal relations (groundwater, surface water and return water; quantity and quality; biotic components; upstream and downstream). The water systems should be studied and managed as part of the broader environment and in relation to socio-economic demands and potentials, acknowledging the political and cultural context. The water itself should be seen as a social, environmental, and economic resource, and each of these three aspects must be represented in the political discourse. This discourse should reflect the interests of local communities and peoples, their livelihoods and their water environments. Users and managers at all levels must be allowed to have an input.

The aim of sustainable river basin management is to ensure the sustained multi-functional use of the basin. Basic water needs of peoples and ecosystems should be fulfilled first. Essential ecological and physical processes should be protected. Moreover, the effects on the receiving water bodies (seas, lakes, deltas, coastal zones) should be paid full attention.

The following points need to be stressed as crucial for sustainable river basin management:

### *General*

- Leadership and political commitment
- Local empowerment and effective public and stakeholder participation in decision-making
- Decision-making at the lowest appropriate level
- Transparent processes
- Commitment to long-term capacity building, also by external support agencies
- Recognition of the role of social policy and economic incentives in managing water demand
- Financing of river basin management
- Maintenance, as much as possible, of the dynamics of the hydrological system; floods not only cause suffering, but also provide life
- Learning from previous experiences (e.g through Twinning)

#### *Institutions*

- Institutions that reflect local conditions, provide a framework for conflict avoidance and management, and are responsive to changing needs
- Flexible water rights responsive to changing (national and international) circumstances
- Clear mandate and sufficient resources for international river basin organisations
- National and international agencies with operational tasks should be accountable to the public and all stakeholders, have sufficient financial and legislative means, and work on the basis of a plan
- Consider ratification and implementation of the UN Watercourses Convention as a means to support river basin management

#### *Planning and implementation*

- Basin-wide planning
- Realistic plans, based on the best available knowledge and adaptive to new knowledge, with sufficient political support and financial means for implementation
- Needs (re)assessment and demand management
- Water markets only when several conditions are met

#### *Monitoring and evaluation*

- Accessible data, analytical tools and information
- Regular evaluations
- Compliance monitoring

## PREAMBLE

We, the participants in the International Workshop on River Basin Management, held in The Hague, 27-29 October 1999, professionals affiliated with international organisations, river basin commissions, national and sub-national governments, national hydrological services, non-governmental organisations and academic institutions from all regions of the world, participating in our personal capacity as experts;

Considering that river basins sustain natural ecosystems, are the paramount source of water, and fulfil non-consumptive, as well as consumptive uses;

Considering also, that in many river basins pressures on the environment, including the marine environment, have reached levels surpassing those that may be sustainable; that vulnerability from extreme natural events has increased; that conflicts between different water uses and between upstream and downstream uses are increasing; and that the capacity of many basins to meet the growing social demands, including basic human needs such as drinking water, is decreasing rapidly;

Recognising that effective river basin management that meets the needs of the present without compromising the ability of future generations to meet their own needs, is a prerequisite for sustainable development, including the social, environmental and economic dimensions;

Recognising furthermore, that effective, sustainable river basin management requires co-operation and political commitment, both within countries, within international basins, and at the global level;

Recognising moreover, that since the United Nations Water Conference in Mar del Plata in 1977, many initiatives have been taken and many international policy documents have been issued to promote sustainable river basin management, such as, the Dublin Statement on Water and Sustainable Development (1992), the Rio Declaration on Environment and Development (1992), Agenda 21, Chapter 18 on freshwater (1992), and the work of the UN Commission on Sustainable Development;

Recognising also, that the UN Convention on the Law of Non-navigational Uses of International Watercourses, which was adopted in 1997 but has not yet

entered into force, contains many elements of relevance for river basin management;

Recognising in addition, that the concepts, principles and rules contained in the different international documents, while most relevant to river basin management, require specification and in many basins still await ratification and/or implementation and/or compliance monitoring;

Having discussed the issue how river basins can be managed in a sustainable way, on the basis of discussion papers, keynote presentations of a generic nature (on river basin management in general, on capacity building and the role of international donors, and on the Vision process and the Framework for Action), and keynote presentations on the management of individual basins (the Danube, Yellow River, Incomati, São Francisco and Colorado basin);

Have formulated the following "Recommendations and Guidelines on Sustainable River Basin Management" and a "Key message", and address them to:

- The Ministerial Conference, to be held on 21-22 March 2000 in The Hague in conjunction with the Second World Water Forum;
- The World Commission on Water in the 21<sup>st</sup> Century, which is preparing the World Water Vision for 2025, initiated by the World Water Council and including the Sector Consultation "Water in Rivers";
- The Global Water Partnership, which is preparing the Framework for Action for implementing the Vision;
- All other national and international governmental and non-governmental actors playing a role, directly or indirectly, in river basin management, such as the UN family of organisations, international banks and donors, national and international river basin organisations, the International Network for River Basin Organisations, national and sub-national governments in charge of (parts of) river basin management, water users associations, environmental NGOs, farmers, industry, consumers, consultants, trainers, teachers and academics.

## RECOMMENDATIONS AND GUIDELINES ON SUSTAINABLE RIVER BASIN MANAGEMENT

### *I: GENERAL*

#### *Leadership*

1. River basin management is often characterised by parochial interests and intractable problems. To achieve progress, leadership and political commitment are essential.

#### *Learning from experience*

2. River basin managers can and should learn from each others' experiences, successes and failures. (cf. recommendation 29 and 30)

#### *Public participation*

3. Public participation and empowerment are necessary conditions for achieving sustainable development. To ensure effective public participation, independent of the goodwill of the authorities, rights of access to information, active participation in decision-making processes, and access to justice need to be legally established. Resources should be made available for the implementation of the outcomes of the public participation process.
4. Effective approaches and methods for public participation need to be devised that can be applied in different cultures and may help to overcome reluctance on the part of the authorities.
5. Since some issues in international river basins can be handled best at the international basin level, public participation should be provided for also at that level. This will contribute to a more integrated management of international river basins.

#### *The importance of water*

6. Water should be seen as a social, environmental and economic resource. The importance of safe drinking water supply and sanitation, the role of water for subsistence farmers and fishermen, and the significance for the different ecosystems should be recognised. Moreover, water plays a key role in many economic processes. Water has a high value, even if it is politically difficult to reflect this value in water transactions.

## *II: INSTITUTIONS*

### *IIa: General*

#### *Criteria*

7. The institutional structure for river basin management should facilitate the necessary co-ordination within the water management sector and between the water management sector and other sectors such as land-use and environment in order to achieve sustainable water use and maintain the balance of the river system.
8. The institutional structure should also be a means of empowerment. All stakeholders should be able to play an active role in river basin management, including economic interest groups, local communities, environmental NGOs and women.
9. Policy formulation, mediatory, regulatory and other management tasks should be well-defined, clearly allocated and made transparent.

#### *General government and river basin commissions for strategic tasks*

10. Strategic tasks with many interfaces between sectors should be the primary responsibility of general (national, regional and local) government, and not of a specific functional institution.
11. River basin authorities with autonomous decision-making powers may be a good option for operational tasks with a narrow scope.
12. River basin commissions should be established for river basins crossing administrative boundaries in order to provide the necessary intergovernmental co-ordination and offer a platform for negotiation.

#### *Decentralisation advisable and usually feasible*

13. Decentralisation should be pursued as much as possible in order to bring river basin management as close as possible to the individual citizens and facilitate local variation in response to differing local conditions and preferences.
14. Decentralisation is also possible in case of tasks with a supra-local scope if the decentralised governments concerned co-operate (e.g. in a river basin commission) or if they are supervised by a higher-level government body.
15. The decentralisation process should be transparent, phased and planned.

#### *Capacity building*

16. The capacity of all institutions needs to be maintained and/or developed by means of short-term and long-term programmes (including postgraduate education and curricula development).

#### *Local institutions*

17. Traditional regimes and institutions should be recognised and integrated in river basin management.

#### *Private sector participation and corporate management*

18. There may be a distinct role for private entities (publicly or privately owned) in the provision of water services and water management. Private ownership of water infrastructure is a controversial issue that needs to be carefully explored.

#### *Water rights*

19. Water rights should be flexible and responsive to changing circumstances at both the national and the international level.

### *IIb: The management of international river basins*

#### *International co-operation: content and development*

20. Mutual understanding and trust and shared information are the basis for international co-operation.
21. Technical co-operation involving the collection and dissemination of information promotes the acceptance of this information by all basin states and stimulates mutual understanding and trust. In times of international conflicts at least technical co-operation should be maintained.
22. Several mechanisms could be used to overcome conflicting (upstream – downstream) interests. Contentious international issues could be linked with other issues (“issue linkage”). Moreover, countries may accept less favourable agreements in the expectation that other countries will do the same in the future (“diffuse reciprocity”). In some cases financial compensation from the benefiting country to the country having to incur costs could be justified, provided the polluter-pays principle is respected.
23. River basin treaties and other forms of international co-operation should reflect the relevant principles of international law, primarily the principles of equitable and reasonable use, the obligation not to cause significant harm, and the duty to notify and exchange information.

#### *International river basin commissions usually advisable*

24. International river basin commissions can perform many useful functions in the management of international basins, such as co-ordination of research and monitoring, co-ordination of river basin management between the participating basin states, planning, compliance monitoring and conflict

resolution. International river basin commissions are almost indispensable for international basins located in more than two states, and advisable for many basins located in two states. States sharing several international waters may also establish joint boundary water commissions.

*International river basin authorities can be practical*

25. International river basin authorities with decision-making and enforcement powers may be a good option for specific operational tasks, such as the restoration of water quality, shipping and the joint operation and management of infrastructure.

*Watercourses convention*

26. Ratification of the 1997 UN Watercourses Convention should be considered as an instrument to facilitate river basin management. In addition, principles with respect to limiting transboundary impacts (1992 UNECE Helsinki Transboundary Watercourses Convention), encouraging public participation (1998 Aarhus Convention), and water and health (1999 Protocol on Water and Health) may supplement the principles in the 1997 UN Watercourses Convention.

*Interdisciplinary forum to develop principles and standards*

27. A global multilateral interdisciplinary forum should be established to develop general principles and minimum standards for the sustainable management of international river basins. All relevant actors, including states, international organisations and non-state actors, such as NGOs and other interest groups, should be enabled to participate in the discussions. The aim of the forum should be to exchange and share experiences and ideas on the management of international river basins.

*International donors and banks can play positive role*

28. The lending operations and programmes of international donors and banks should reflect the principles and considerations expressed in this document. Donors and recipient countries should co-ordinate funding programmes in order to ensure a coherent approach and long-term solutions.

*Co-operation and twinning important for strengthening river basin management*

29. Co-operation and mutual support between river basin organisations are important means of strengthening river basin management. Twinning of river basin organisations is an important form of such co-operation. It should aim at mutual learning and capacity building with respect to operational management, planning, institutions, mediation and analytical support.

30. Such co-operation is most effective if the partners are both national or both international organisations. Moreover, the partners should be comparable with respects to some, but not all of the following groups of parameters:
- a. The tasks and competencies of the river basin organisations and their internal structure
  - b. The size and hydrology of the basins and the level of environmental pressure
  - c. The socio-economic and cultural context

*III: POLICY AND PLANNING*

*Function, scope and limitations of planning*

31. Planning (the formulation of plans and policies) is an important and often indispensable means to support and improve operational management. Planning has four related functions:
- a. To assess the current situation (including the identification of conflicts and priorities), formulate visions, set goals and targets, and thus orient operational management
  - b. To provide a framework for organising policy relevant research and public participation
  - c. To increase the legitimacy, public acceptance of, or even support for operational management
  - d. To facilitate the interaction and discussion among managers and stakeholders, offer a common point of reference (the plan or policy), and thus provide co-ordination
32. Planning should involve, in a systems framework, all phenomena, institutions and issues that affect the allocation and protection of inland waters. It should not result in negative effects on other natural resources and should consider linkages to plans for biodiversity management, coastal protection, ocean health, and human health and well being.
33. Planning should be focussed and coherent and be in proportion to the resources available for implementation. Planning should be rooted in the real problems to be solved and be realistic.
34. Planning systems should be evaluated to check whether they serve their purpose; planning systems should not be taken for granted.
35. Given the differences in problem situations and cultures, planning systems should reflect the local situation.

#### *Sectoral and intersectoral strategic plans*

36. For international river basins and national basins located in several jurisdictions, strategic water management plans should be prepared that preferably cover the complete basin. The main function should be to co-ordinate water management between the different jurisdictions and offer a framework for negotiation. The planning process should be open to linkage with issues outside of the water sector, since this may result in win-win solutions for upstream-downstream conflicts, which otherwise would have a win-lose character.
37. For river basins falling within one jurisdiction, strategic river basin management plans should be prepared that are *intersectoral* in character. In such basins intersectoral planning offers good opportunities for intersectoral co-ordination.
38. Strategic (water management or intersectoral) plans should typically include or reflect, *inter alia*:
  - a. Institutional arrangements
  - b. Capacity building policy
  - c. Public participation
  - d. Transparency of decision making
  - e. Legitimacy
  - f. Structural and non-structural measures
  - g. Economic aspects and efficiency
  - h. Compliance

#### *Operational plans*

39. The operational manager should be committed to and hence be involved in (or even better, responsible for) operational planning. Depending on the institutional structure, the geographical scope of operational plans could or could not coincide with river basins or subbasins.
40. Operational plans should be realistic and consider the management capacity (finances, personnel, legal resources, etc.) that is or can be made available for the planning period. If necessary, the proposed measures should be adjusted accordingly, and shortcomings in the management capacity should be indicated.

#### *Planning processes*

41. To improve the quality and practicability of the planning exercise, planning processes should be participatory and involve all interested parties, preferably directly.

## *IV: OPERATIONAL MANAGEMENT*

#### *Key role of operational management*

42. The only form of river basin management that directly affects the river basin and its users is operational management (the application of regulatory, economic and communicative policy instruments and concrete activities such as infrastructure management). Consequently, it should play a pivotal role in any river basin management strategy. Planning, policies, analytical tools and institutional systems play an essential role as deciders and facilitators. They can improve operational management, promote a basin-wide, intersectoral long-term approach, and in this way further the sustained multi-functional use of the basins concerned.

#### *Effective and accountable operational management*

43. National and international agencies charged to execute operational decisions should be accountable to all stakeholders (including the public) through appropriate governance. They should work on the basis of a plan and be equipped with the necessary financial and legislative means.

#### *Flood and Drought Management*

44. Floods not only cause suffering but also support life. Flood management should not be based solely on building dykes and dams. It needs to be based on strategies that use both structural and non-structural methods. The strategy should balance all interests involved and be based on an integrated assessment, of the environmental, economic and human costs and benefits of these alternatives, including their potential contribution to drought mitigation and including the possibilities that they offer for nature.

#### *Pollution control*

45. The ultimate goal of pollution control is to close substance cycles and in this way prevent pollution. A mix of instruments for regulation and compliance can be used to move into this direction and solve urgent pollution problems: waste control, process and emission standards, and a water quality approach. The exact mix should reflect *inter alia* the local management capacity and the availability of water quality data and other data.

#### *Communicative instruments complement to regulation*

46. Communicative instruments for operational management, such as voluntary agreements, can help to improve the implementation of river basin plans and policies, but they only work in relation to (pending) regulation and compliance mechanisms.

#### *Water markets under conditions*

47. Tradable water rights can be an important tool for river basin management, but they are only effective if a number of conditions are met:
  - a. The basic water demands of citizens and ecosystems are safeguarded
  - b. The rights should be defined and agreed upon
  - c. Utilisation of the rights should be physically possible
  - d. Monopolies can be prevented
  - e. For international river basins: an international agreement to that extent has been concluded.
48. Tradable emission rights are often not feasible because of the large number of different pollutants – many of which will only be emitted by one or few polluters in a sub-basin – and in case of diffuse pollution.

#### *Charges*

49. Charges are effective and efficient means to finance river basin management (cost recovery) and reduce water use and pollution if the basic water needs of the poor are safeguarded, e.g. by means of block tariffs.

### *V: MONITORING AND EVALUATION*

#### *The need for data and information*

50. Effective river basin management requires sound data, information and knowledge, including both data on surface and groundwater (quantity and quality) and social and economic data. Collection and processing of relevant data, easy accessibility and broad dissemination are eminent tasks of river basin management.
51. To increase policy relevance, data should be aggregated into meaningful information, for example in the form of indicators and systems for benchmarking.
52. Compliance monitoring (reporting, reviewing and evaluating) is very important for promoting the implementation of plans.

#### *International impact assessment*

53. Within international river basins the social, economic, regulatory and environmental consequences of planned developments for other countries should be evaluated.

#### *Harmonisation of monitoring and analysis methods*

54. Monitoring and analysis methods should be harmonised nationally and, in case of international basins, internationally.

#### *Exchange and dissemination of data and knowledge*

55. The unrestricted exchange of data and knowledge is a prerequisite of efficient management and co-operation in both national and international river basins. Monitoring data collected with public funds should be publicly available and easily accessible, nationally and internationally.

#### *A comprehensive analytical model*

56. To support river basin management, a new analytical model should be developed that can aggregate socio-economic, political, institutional and technological potentials and hydrological constraints. This model should furthermore be capable of evaluating the actual management capacity.

#### *Requirements for analytical methods*

57. To support strategic planning, methods for analytical support should be developed that:
  - a. cover the whole basin and all significant impacts;
  - b. specifically consider the socio-economic processes that affect the basin;
  - c. predict the socio-economic effects of alternative strategies; and
  - d. present the issues in such a way that people can understand them.
58. Methods for analytical support should furthermore reflect the fact that policy analysis can never rely on quantitative information only. Moreover, these methods should be transparent and flexible, promote policy learning by all actors, and facilitate negotiation processes. Appropriate methods may include argumentative policy analysis and role-playing supported by a computer model of the natural system and the socio-economic effects.

#### *Decentralised information systems*

59. There is a large role for appropriate decentralised information systems and networks that can promote interaction among sectors, provide a basis for consistent technical studies, help communication with the public, and stimulate participation.

### *VI: IMPLEMENTING SUSTAINABLE RIVER BASIN MANAGEMENT*

60. To implement the general principles contained in these Recommendations and Guidelines, promote policy learning and continuously improve river basin management, States should specify the principles for their country and their basins, following a cyclic policy development approach. Such an approach would include the following steps:

1. Assessment of institutions, needs and resources
2. Planning
3. Implementation
4. Compliance monitoring
5. Evaluation

#### **Annex A: LIST OF PARTICIPANTS**

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Ms P. Wouters, University of Dundee, CPMLP, United Kingdom  
Mr K. Yasinok, GAP Regional Development Administration, Turkey

## Annex B: PROGRAMME

### Wednesday, 27 October 1999

Chair: R. Brouwer

#### 13.30-14.00 Opening addresses

- *Mr K. Zoeteman*, Deputy Director-General for Environment, Ministry of Housing, Spatial Planning and the Environment, The Netherlands
- *Ir L.H. Keijts*, Vice Director-General Water Management, Ministry of Transport, Public Works and Water Management, The Netherlands
- *Prof. ir H.J. Overbeek*, Dean Faculty of Civil Engineering and Geosciences, Delft University of Technology

#### 14.00-14.30 Introduction to the workshop and keynote paper river basin management. *E. Mostert*

#### 14.30-15.00 Discussion

#### 15.00-15.30 Tea

#### 15.30-16.00 Keynote paper on Incomati basin. *A. Carmo Vaz*

#### 16.00-16.30 Keynote paper on the Yellow River basin. *Wenxue Li*

#### 16.30-17.00 Keynote paper on Danube basin. *L. Kardoss*

#### 17.00-17.30 Discussion

#### 17.30-19.00 Reception

### Thursday, 28 October 1999, morning session

Chair: R. Brouwer

#### 9.00-9.30 Keynote paper on Sao Francisco basin. *R. Gaal Vadas*

#### 9.30-10.00 Keynote paper on Colorado basin. *B. Johnson*

#### 10.00-10.30 Coffee

#### 10.30-13.00 Parallel sessions, part I:

##### A: Operational management

Moderator: *M. Mutale*, rapporteur: *J. Bogardi*

##### B: National and international institutional framework and inter- national co-operation

Moderator: *D. Jassikova*, rapporteur: *I. Betlem*

C: Policy and planning (including public participation and analytical tools)

Moderator: *F.N. Correia*, rapporteur: *E. van Beek*

- Introduction by moderators

- Inventory main issues and possible recommendations

13.00-14.15 Lunch

#### Thursday, 28 October 1999, afternoon session

Chair: A Rahman

14.15-14.45 Keynote paper on the role of river basin management in the Vision process and Framework for Action up to now. *T. Allan*

14.45-15.15 Keynote paper on role international organizations and donors.

*G.J. Alaerts*

15.15-15.45 Tea break

15.45-18.00 Parallel sessions, part II: formulation of conclusions and recommendations

20.00 Dinner

#### Friday, 29 October 1999

Chair: P. Wouters

9.00-9.30 Plenary reporting of results parallel sessions

9.30-10.30 Plenary discussion

10.30-11.00 Coffee

11.00-12.30 Plenary discussion, continued

12.30-13.00 Closure

13.00-14.00 Lunch

#### Saturday, 30 October 1999

Excursion to the Water Works Biesbosch, the Biesbosch nature area, and the windmills at Kinderdijk (UNESCO world heritage site)

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