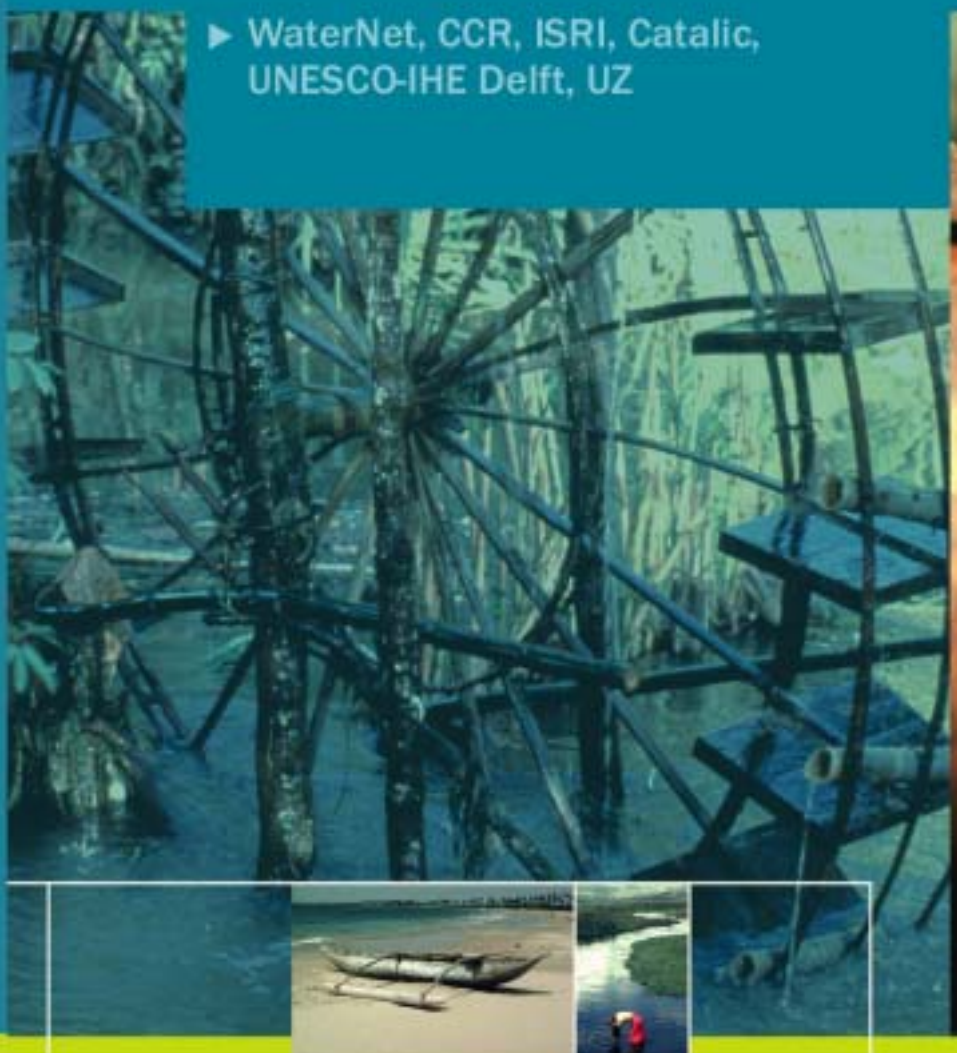
PC→CP

Conflict Prevention and Cooperation in International Water Resources - Course Book

▶ WaterNet, CCR, ISRI, Catalic, UNESCO-IHE Delft, UZ



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Conflict Prevention and Cooperation in International Water Resources

Course book

Course B

(SC-2003/WS/72)

“Conflict prevention and cooperation in international water resources”

Course book

Table of Contents

WaterNet, in collaboration with the Centre of Conflict Resolution CCR (South Africa), the Instituto Superior de Relações Internacionais ISRI (Higher Institute of International Relations) (Mozambique), Catalic (The Netherlands/Mozambique), UNESCO-IHE Delft (The Netherlands) and the University of Zimbabwe (Zimbabwe), has developed

a course on

Conflict Prevention and Cooperation in International Water Resources

Introduction

The need for training in conflict mediation and negotiation in water in Southern Africa was first mentioned by a regional assessment of education, training and research needs conducted by the Institute of Water and Sanitation Development in 1998. On the basis of a regional survey, the assessment study specifically identified the need to train professionals in international water law and diplomacy. The report stated:

> Negotiation techniques appear to be an emergent field, not only to address international and cross-border issues, but also at the local level to negotiate with stakeholder groups. [1]

This formed the regional backdrop against which the current course on "Conflict prevention and cooperation in international water resources" was developed. Two different groups of experts were identified that would benefit from such a course.

Water experts who are involved in negotiating water issues. These may include managers of catchment areas within country who may need to mediate between water users with conflicting interests; and senior water managers who may be part of country delegations that negotiate with other riparian countries on sharing water of international river basins. Typically, water managers will be well-versed with water issues but may lack negotiation and mediation skills, and may lack sufficient insights into legal issues.

"Non-water" experts, including legal experts, diplomats and international relations experts. Within country, legal experts may be tasked, for instance, to review legislation and regulations concerning water, such as draft water bills and draft permit regulations, and to advise water departments if major conflicts between water users arise. In addition, lawyers, diplomats and international relations experts may form part of country delegations negotiating water sharing agreements with riparian countries. These experts typically have a good knowledge of legal issues and may have been exposed to negotiation situations, but may lack an appreciation of the specific water issues that are the object of negotiation.

[1] Ndamba, J., and P. van der Zaag, 1998, Assessment of integrated water resources management activities in the Southern Africa region. Institute of Water and Sanitation Development, Harare; page 9

This course is designed such that experts from both target groups are “mixed” and follow the same course. One major advantage of having participants with different professions and skills in one course is that it will enhance mutual understanding and respect, as participants will share their differing experiences and perspectives. In addition, in practice the water and non-water experts will often work together in teams, such as in country delegations negotiating water sharing agreements. The course will stimulate team work.

This coursebook on “Conflict prevention and cooperation in international water resources” can be used both for a 10 day course as for a 5 day course. Where as the 10 day course is aiming at reaching middle level professionals, postgradual students and stakeholder representatives, the 5 day course is focussing on high level professionals and stakeholder representatives. The 5 day course consists of a selection of certain chapters within this manual (see course content and course programme for 5 day course). The Reader and Handout have been equally adapted for the short course.

Aim and objectives

The **aim** of the course “Conflict prevention and cooperation in international water resources” is to contribute to regional water security and peace through strengthening water diplomacy. The course therefore emphasises that water can and will bring peoples and countries together, and aims to debunk the myth that water may be a cause of conflict. The course imparts insights and skills that aim to unlock the cooperation potential in water resources management.

The **specific objectives** of the course are:
a. to enhance the understanding of conflict transformation and impart negotiation skills
b. to enhance insights in Integrated Water Resources Management
c. to strengthen regional water diplomacy.

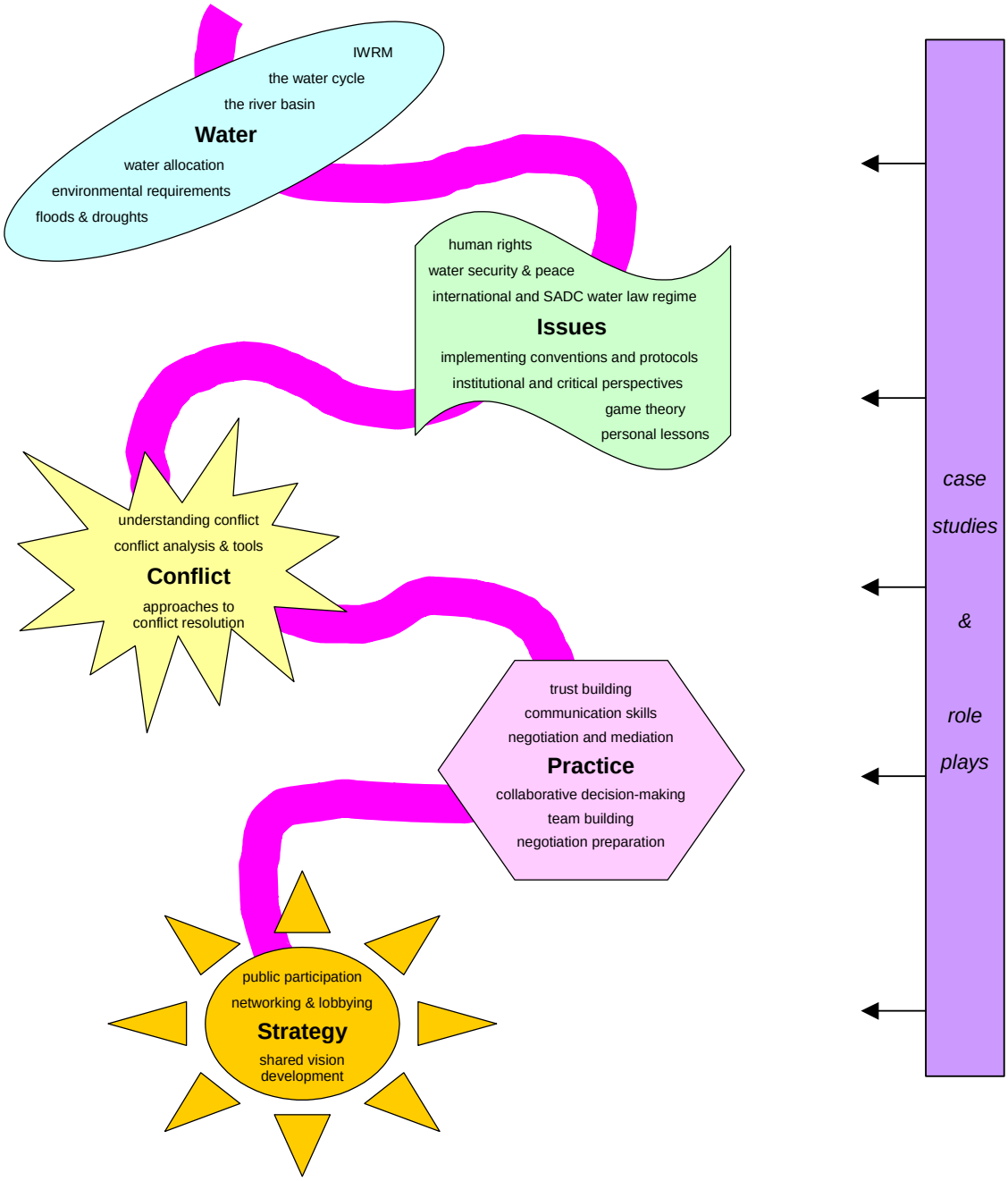
The **subjects** addressed include:
- Theory and practice of conflict prevention
- Conflict management tools
- Skills training in communication, mediation and negotiation
- Shared vision development
- International water law
- Water allocation issues in the context of integrated water resources management
- Water diplomacy

The course is designed to give participants hands-on experience with conflict management in the context of water resources. The course includes an extended near real-life interactive roleplay. (only in 10 day course)

Course content

The course content includes the following 6 parts, which are graphically presented in a “road map” on the next page:

Part 1: Water
Part 2: Issues
Part 3: Conflict
Part 4: Practice
Part 5: Strategy
Part 6: Roleplay (only in 10 day course)



Roadmap of the course
"Conflict prevention and cooperation in international water resources"

The 5 parts or clusters of course subjects are briefly introduced as follows:

1. **Water:** Insights related to the physical aspects of water resources, water allocation and environmental and water quality issues, Integrated Water Resources Management, and water management frameworks and issues at the regional level.

2. **Issues:** Overarching instruments of international water law and their institutional frameworks, both at the international and the regional levels. Human rights, water and security. The implementation of these instruments and the practical functioning of related frameworks in the regional context.

3. **Conflict:** theory and approaches to conflict resolution

4. **Practice:** tools related to negotiation including skills training, communication, teamwork, negotiation preparation,

5. **Strategy:** the importance of broadening the base for negotiations, including the need for public participation, networking and lobbying, and shared vision development.

During the course, many cross-references between these clusters are made. Case studies and roleplays during the course ensure integration of different course elements, with the emphasis on skills practice in a context of water resources.

In order to place course subjects in the broader perspective of international negotiations, participants are familiarised with various contexts of international negotiations and are solicited to identify relevant factors in the specific regional environment. These thematically defined contexts are presented as interwoven elements, all impacting on the core processes and outcomes of negotiations. These are:

· regional and national stability and peace;
· international legal and institutional frameworks;
· political and ideological doctrines and systems;
· cultural environments;
· national legal frameworks and government institutions and
· economic and social order.

The next page provide the detailed course content, as well as a general outline of the time schedule.

The **course materials** consist of:

- a course book (in 6 parts)
- a course reader
- suggestions for further reading (reference documents provided in electronic form on CD Rom)
- additional hand outs (for exercises etc.)

Course content "Conflict prevention and cooperation in international water resources" – 10 day Course

Part 1: Water

B 1.1 Introduction to Integrated Water Resources Management
B 1.2 Water allocation
B 1.3 Water quality issues in international rivers
B 1.4 Floods and droughts in international rivers

Part 2: Issues

B 2.1 Human rights and conflict management
B 2.2 Water security and peace
B 2.3 International water law regimes
B 2.4 Game theory
B 2.5 SADC and international waters
B 2.6 Implementing conventions and protocols
B 2.7 Institutional and critical perspectives on shared rivers
B 2.8 Personal lessons by senior negotiators

Part 3: Conflict

B 3.1 Understanding conflict
B 3.2 Conflict analysis
B 3.3 Approaches to conflict resolution

Part 4: Practice

B 4.1 Trust-building
B 4.2 Communication skills
B 4.3 Interest-based processes: negotiation and mediation
B 4.4 Collaborative decision-making; including gender aspects
B 4.5 Team building / role clarification
B 4.6 National negotiation preparation

Part 5: Strategy

B 5.1 Public participation
B 5.2 Networking and lobbying
B 5.3 Shared vision development

Part 6: Roleplay

Part 7: Evaluation

Course programme 10 day cours (tentative)

Day	Morning	Afternoon
1	B 1.1: Introduction to IWRM B 2.1: Human rights and conflict management	B 1.2: Water allocation B 2.2: Water security and peace
2	B 2.3: International water law regimes B 1.3: Water quality issues in international rivers	B 1.4: Floods and droughts in international rivers B 2.4: Game theory
3	B 2.5: SADC and international waters	B 2.8: Personal lessons by senior negotiators
4	B 2.6: Implementing conventions and protocols B 2.7: Institutional and critical perspectives on shared rivers	B 3.1: Understanding conflict B 3.2: Conflict analysis
5	B 3.3: Approaches to conflict resolution B 4.1: Trust-building	B 4.2: Communication skills
6	B 4.2: Communication skills	B 4.3: Interest-based processes: negotiation and mediation
7	B 4.3: Interest-based processes: negotiation and mediation	B 4.4: Collaborative decision-making; including gender aspects B 4.5: Team building / role clarification B 4.6: National negotiation preparation
8	B 5.1: Public participation B 5.2: Networking and lobbying	B 5.3: Shared vision development B 6: Negotiation Roleplay
9	B 6: Negotiation Roleplay	B 6: Negotiation Roleplay
10	B 6: Negotiation Roleplay B7: Evaluation	

Course content "Conflict prevention and cooperation in international water resources" – 5 day Course

Part 1: Water
B 1.1 Introduction to Integrated Water Resources Management

Part 2: Issues
B 2.1 Human rights and conflict management
B 2.3 International water law regimes
B 2.5 SADC and international waters
B 2.8 Personal lessons by senior negotiators

Part 3: Conflict
B 3.1 Understanding conflict
B 3.2 Conflict analysis
B 3.3 Approaches to conflict resolution

Part 4: Practice
B 4.1 Trust-building
B 4.2 Communication skills
B 4.3 Interest-based processes: negotiation and mediation
B 4.4 Collaborative decision-making; including gender aspects
B 4.5 Team building / role clarification
B 4.6 National negotiation preparation

Part 5: Strategy
B 5.1 Public participation
B 5.2 Networking and lobbying
B 5.3 Shared vision development

Part 6: Evaluation

Course programme 5 day course(tentative)

Day	Morning	Afternoon
1	B 1.1: Introduction to IWRM B 2.3: International water law regimes B 2.5: SADC and international waters	B 2.1: Human rights and conflict management B. 3.4. Personal lessons by senior negotiators
2	B 3.1: Understanding conflict B 3.2: Conflict analysis B 3.3: Approaches to conflict resolution	B 4.1: Trust-building B 4.2: Communication skills
3	B 4.2: Communication skills	B 4.3: Interest-based processes: negotiation and mediation
4	B 4.3: Interest-based processes: negotiation and mediation	B 4.4: Collaborative decision-making; including gender aspects B 4.5: Team building / role clarification B 4.6: National negotiation preparation
5	B 5.1: Public participation B 5.2: Networking and lobbying B 5.3: Shared vision development	B 5.3: Shared vision development B 6: Evaluation

Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 1

Water

Table of Contents

B 1.1

Introduction to Integrated Water Resources Management

Code	B 1.1
Teaching topic	Introduction to IWRM
Time (hrs)	3
Content/Skill focus	Introduction to Integrated Water Resources Management
Objectives	1. To achieve a shared understanding of the definition of IWRM, as well as related concepts 2. To apply key principles of IWRM when analysing water issues
Learning methodology	Conventional lecture; enlightened with many examples drawn from all over the world with specific reference to Southern Africa Exercises
Trainer/facilitator guide	- the water cycle; rainbow - water use and demand - the value of water - key characteristics - defining IWRM; Dublin principles - policy principles - sustainability - institutional aspects - strategic issues
Course book	H.H.G. Savenije, B. Gumbo and P. van der Zaag: “Principles of Integrated Water Resources Management”
Course reader	
Further reading	Savenije, H.H.G., 1998, How do we feed a growing world population in a situation of water scarcity? Paper presented at the 8th Stockholm Water Symposium Kasrils, R., 2001, The value and price of water (The women of Lutsheko). *Water Science and Technology* **43**(4): 51-55 Savenije, H.H.G., 2002, Why water is not an ordinary good, or why the girl is special. *Physics and Chemistry of the Earth* **27**: 741-744

Introduction to Integrated Water Resources Management

Hubert Savenije, UNESCO-IHE Delft
Bekithemba Gumbo, University of Zimbabwe
Pieter van der Zaag, UNESCO-IHE Delft and University of Zimbabwe

1 The water cycle

Water is finite on earth. There is a fixed amount of water which neither decreases or increases. Fresh water is a renewable resource because of the water cycle. From a human perspective the source of freshwater is rainfall. Most of this rainfall is used directly for vegetative growth, such as natural vegetation, pasture, rain-fed maize etc. This process, known as transpiration, is highly productive and produces in Southern Africa the bulk of food crops.

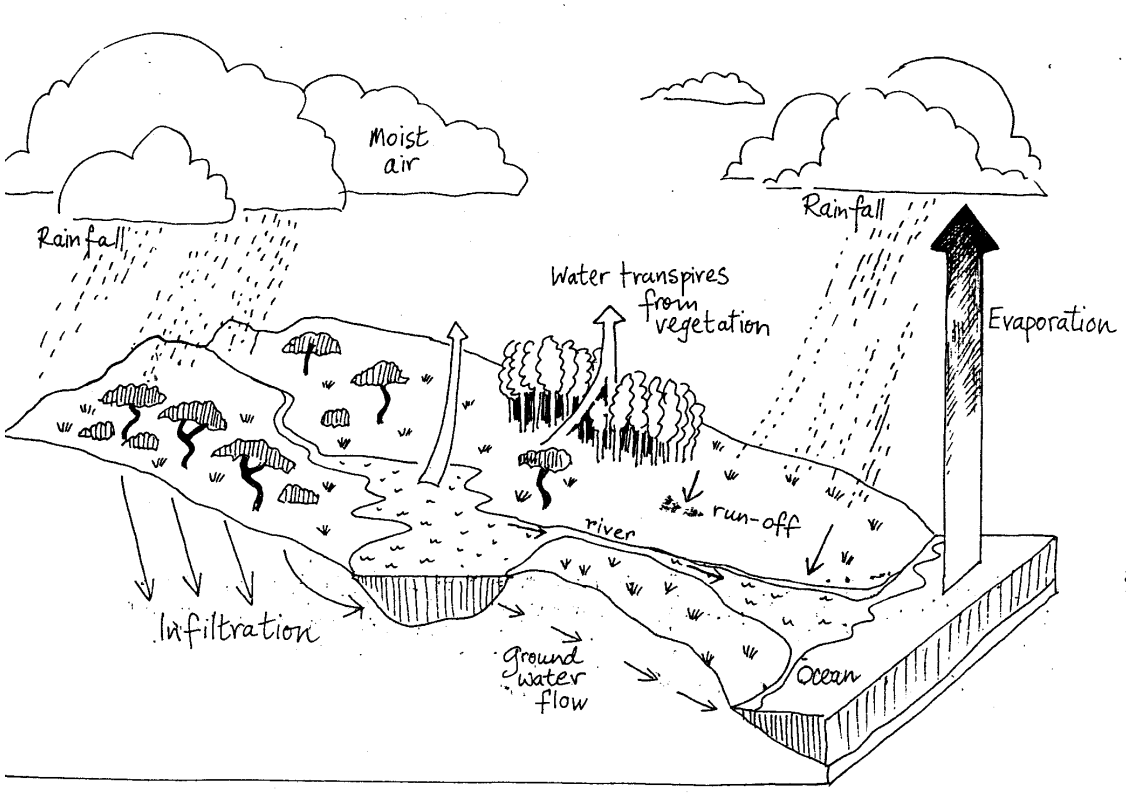


Figure 1 The water cycle (Pallett, 1997:20)

Only a small portion of the rainfall flows into rivers as surface water and recharges groundwater (Figure 2). This water is used for domestic water supply, industrial production, irrigated agriculture etc. This is the water that we tend to harness through infrastructure development (e.g. dams, wells) and that we tend to pollute.

If we talk about Integrated Water Resources Management, we mean to consider the entire water cycle. This means that we also look at rain-fed agriculture production, soil and water conservation within the watershed, rainwater harvesting techniques etc.

To facilitate the comprehensive thinking in terms of the entire water cycle, three types of water can be distinguished, together forming the 'rainbow' of water.

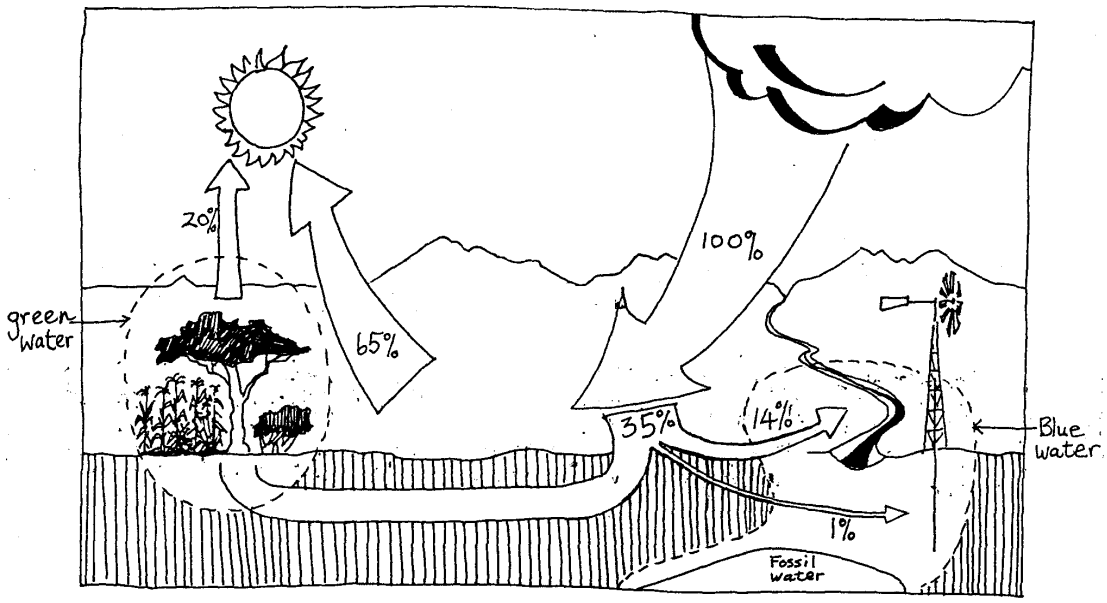


Figure 2 Schematic water balance for Southern Africa, showing the average partitioning of rainfall (Pallett 1997: 22)

Box 1: Some of the "Magic" Properties of Water

- Water is the primary component of cells, making up as an average 60 to 70% of its weight;
- Water is the only non-organic liquid that exists under our normal conditions of temperature and pressure and that acts as a dissolvent of many substances to be absorbed by our bodies;
- Water is unique in the sense that when changing into ice (solid state), it expands and floats in the liquid water instead of sinking like most of other substances. That is why we can skate, that icebergs float, and rivers flow under the ice;
- Water needs lot of energy to warm up, making the weather more pleasant and with fewer temperature fluctuations near the oceans and lakes where there are large bodies of water.

A rainbow of water

The rainbow of water (Savenije, 1998) distinguishes three types of water depending on their occurrence in the water cycle (Figure 3).

- 'white' water = rainfall and that part of rainfall which is intercepted and immediately evaporates back to the atmosphere
- 'blue' water = water involved in the runoff (sub-)cycle, consisting of surface water and groundwater (below the unsaturated zone)
- 'green' water = water stemming directly from rainfall, that is transpired by vegetation (after having been stored in the unsaturated zone) (Falkenmark, 1995)

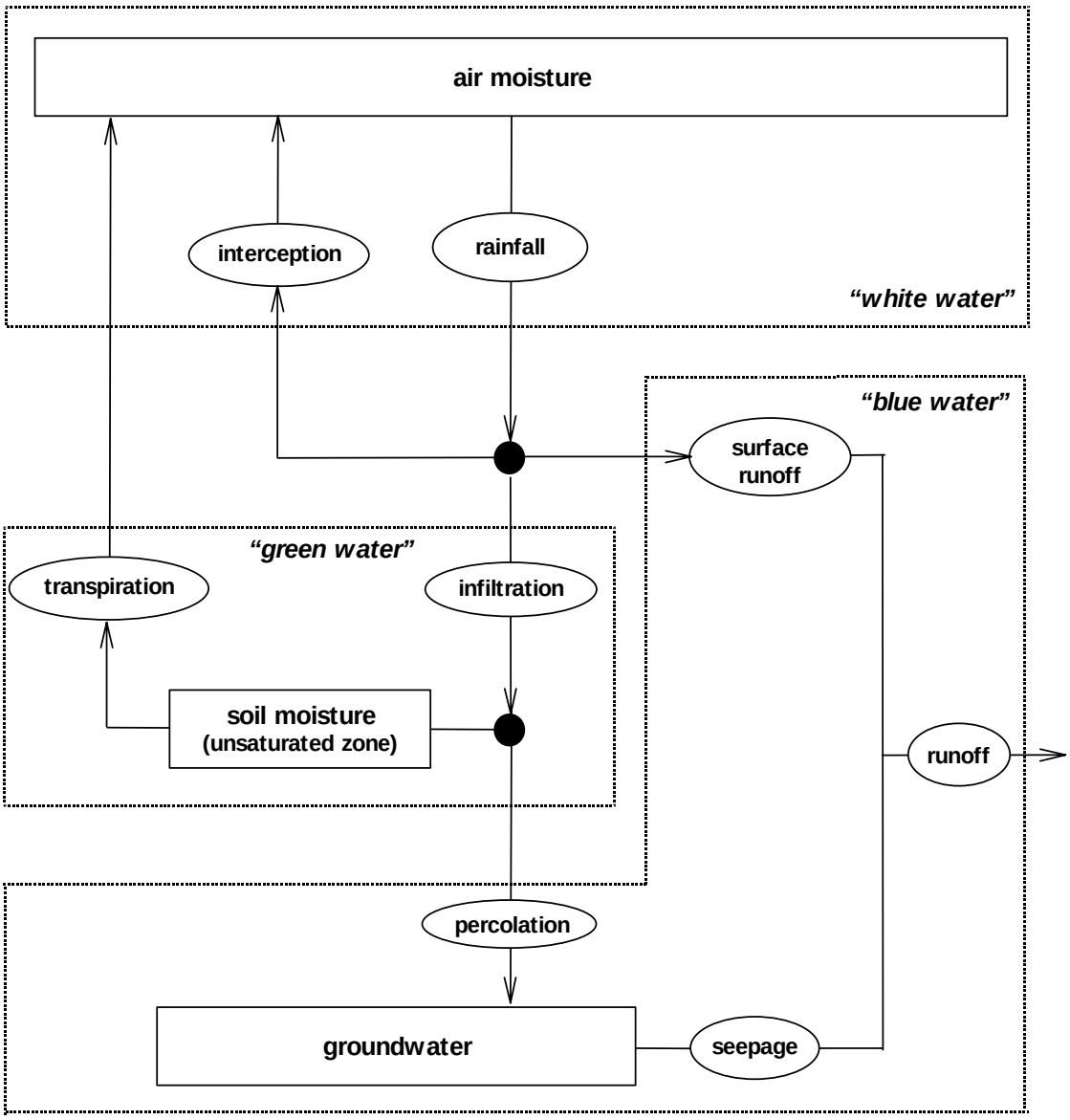


Figure 3 The hydrological cycle, with 'white', 'green' and 'blue' water, and the two partitioning points

Water use

There are a large number of types of water use. Among these are:

- Rainfed agriculture
- Irrigation
- Domestic use in urban centres and in rural areas
- Livestock
- Industrial and commercial use
- Institutions (e.g. schools, hospitals, government buildings, sports facilities etc.)
- Waste and wastewater disposal
- Cooling (e.g. for thermal power generation)
- Hydropower
- Navigation
- Recreation
- Fisheries
- The environment (wildlife, nature conservation etc.)

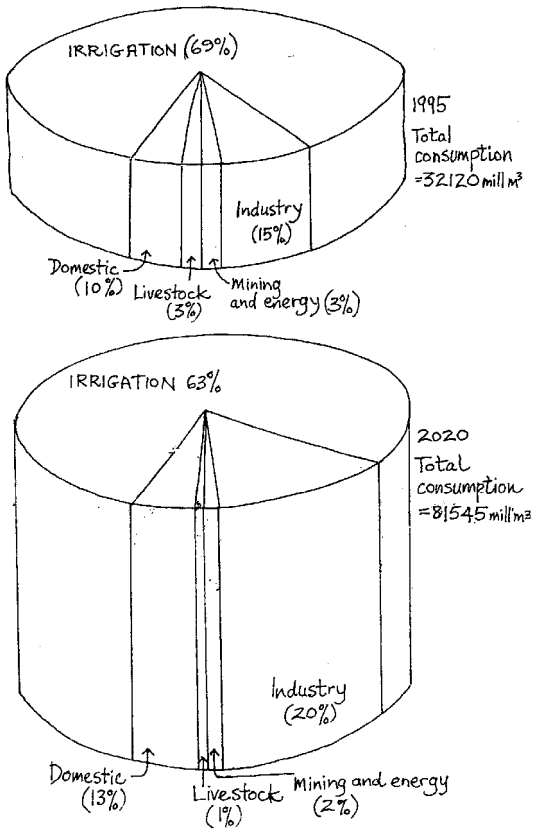


Figure 4 Water use in Southern Africa in 1995 (Pallett, 1997:38)

Demand for, and use of water

Demand for water is the amount of water required at a certain point. The *use* of water refers to the actual amount reached at that point.

We can distinguish *withdrawal uses* and *non-withdrawal* (such as navigation, recreation, waste water disposal by dilution) uses; as well as *consumptive* and *non-consumptive* uses. Consumptive use is the portion of the water withdrawn that is no longer available for further use because of evaporation, transpiration, incorporation in manufactured products and crops, use by human beings and livestock, or pollution.

The terms “consumption”, “use” and “demand” are often confused. The amount of water actually reaching the point where it is required will often differ from the amount required. Only a portion of the water used is actually consumed, i.e. lost from the water resource system.

A similar confusion exists when talking about *water losses*. It depends on the scale whether water is considered a loss or not. At the global scale, no water is ever lost. At the scale of an irrigation scheme, a water distribution efficiency of 60% indeed means that slightly less than half of the water is lost. Part of this water, however, may return to the river and be available to a downstream user. At the scale of the catchment, therefore, it is the transpiration of crops (60% in this example) that can be considered a loss!

While the total available freshwater is limited (finite), demand grows. Hence the importance of water resources management.

2 Three characteristics of water

Water has at least three important physical attributes with a bearing on management:

- Fresh water is *vital* to sustain life, for which there is no substitute. This means that water has a (high) *value* to its users.
- Although water is a renewable resource, it is practically speaking *finite*. The use of water is therefore *subtractible*, meaning that the use by somebody may preclude the use by somebody else.
- Water is a *fugitive* resource. It is therefore difficult to assess the (variations in) *stock* and *flow* of the resource, and to define the *boundaries* of the resource, which complicate the planning and monitoring of withdrawals as well as the *exclusion* of non-members.

The vital nature of water gives it characteristics of a *public good*. Its finite nature confers to it properties of a *private good*, as it can be privately appropriated and enjoyed. The fugitive nature of water, and the resulting high costs of exclusion, confers to it properties of a *common pool resource*. In addition, water is indivisible, non-substitutable and bulky. For further reading on the special character of water, see Savenije (2002).

Water resources management aims to reconcile these various attributes of water. This is obviously not a simple task. The *property regime* and *management arrangements* of a water resources system are therefore often complex.

3 Integrated water resources management

There is growing awareness that comprehensive water resources management is needed, because:

- fresh water resources are limited;
- those limited fresh water resources are becoming more and more polluted, rendering them unfit for human consumption and also unfit to sustain the ecosystem;
- those limited fresh water resources have to be divided amongst the competing needs and demands in a society
- many citizens do not as yet have access to sufficient and safe fresh water resources
- techniques used to control water (such as dams and dikes) may often have undesirable consequences on the environment
- there is an intimate relationship between groundwater and surface water, between coastal water and fresh water, etc. Regulating one system and not the others may not achieve the desired results.

Hence, engineering, economic, social, ecological and legal aspects need to be considered, as well as quantitative and qualitative aspects, and supply and demand. Moreover, also the 'management cycle' (planning, monitoring, operation & maintenance, etc.) needs to be consistent.

Integrated water resources management, then, seeks to manage the water resources in a comprehensive and holistic way. It therefore has to consider the water resources from a number of different perspectives or dimensions. Once these various dimensions have been considered, appropriate decisions and arrangements can be made.

Due to the nature of water, integrated water resources management has to take account of the following four dimensions:

1. the *water resources*, taking the entire hydrological cycle in account, including stock and flows, as well as water quantity and water quality; distinguishing for instance white, green, grey and blue water

2. the *water users*, all sectoral interests and stakeholders

3. the *spatial scale*, including
   3.1 the spatial distribution of water resources and uses
   3.2 the various spatial scales at which water is being managed, i.e. individual user, user groups (e.g. user boards), watershed, catchment, (international) basin; and the institutional arrangements that exist at these various scales

4. the *temporal scale*; taking into account the temporal variation in availability of and demand for water resources, but also the physical structures that have been built to even out fluctuations and to better match the supply with demand.

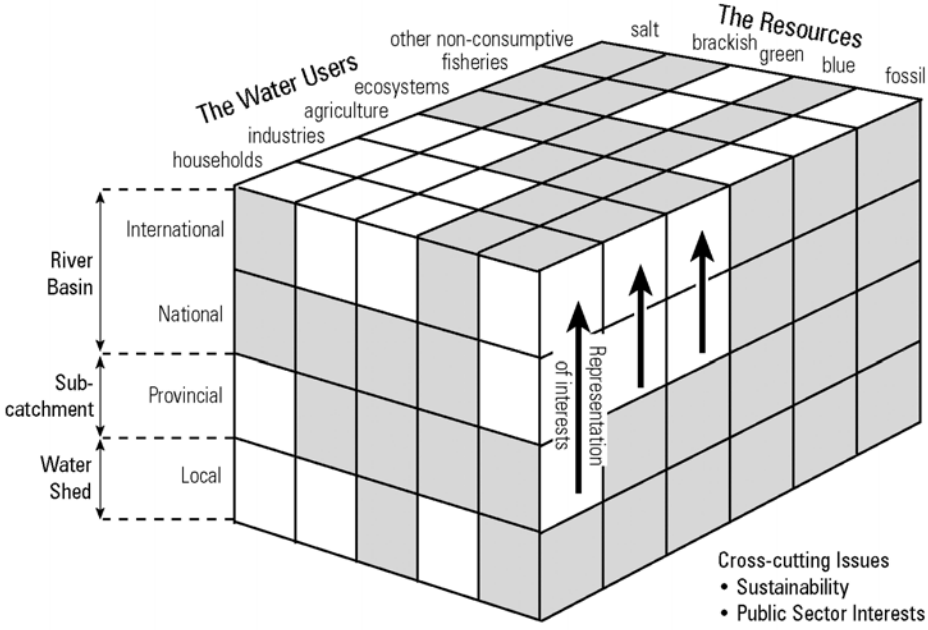


Figure 5 Three of the four dimensions of Integrated Water Resources Management (Savenije, 2000)

Integrated Water Resources Management can now be defined as:

> Integrated Water Resources Management (IWRM) is a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

This is the definition proposed by the Global Water Partnership.

Integrated Water Resources Management therefore acknowledges the entire water cycle with all its natural aspects, as well as the interests of the water users in the different sectors of a society (or an entire region). Decision-making would involve the integration of the different objectives where possible, and a trade-off or priority-setting between these objectives where necessary, by carefully weighing these in an informed and transparent manner, according to societal objectives and constraints. Special care should be taken to consider spatial scales, in terms of geographical variation in water availability and the possible upstream-downstream interactions, as well as time scales, such as the natural seasonal, annual and long-term fluctuations in water availability, and the implications of developments now for future generations.

To accomplish the integrated management of water resources, appropriate legal, institutional and financial arrangements are required that acknowledge the four dimensions of IWRM. In order for a society to get the right arrangements in place, it requires a sound policy on water.

4 Policy principles

For a country to change its water management towards a more holistic and integrated management system, it will require to review its water policy. This is currently on-going in many countries in Southern Africa, or has been recently concluded. A water policy often starts with the definition of a small number of basic principles and objectives, such as the need for sustainable development and desirable socio-economic development.

Three key policy principles are known as the three '**E**'s as defined by Postel (1992):

a) **E**quity: Water is a basic need. No human being can live without a basic volume of fresh water of sufficient quality. Humans have a basic human right of access to water resources (see Gleick, 1999). This policy principle is related to the fact that water is often considered a public good. Water is such a basic requirement for human life and survival that society has to defend the uses of the water resources in the public interest. From here a number of other issues can be derived, such as security (protection against floods, droughts, famine and other hazards).

b) **E**cological integrity: Water resources can only persist in a natural environment capable of regenerating (fresh) water of sufficient quality. Only sustainable water

use can be allowed such that future generations will be able to use it in similar ways as the present generation.

c) **E**fficiency: Water is a scarce resource. It should be used efficiently; therefore, institutional arrangements should be such that cost recovery of the water services should be attained. This will ensure sustainability of infrastructure and institutions, but should not jeopardise the equity principle. Here comes in the issue of water pricing, and whether or not water should be priced according to its economic value.

Much of water resources management deals with finding suitable compromises between these policy principles that sometimes are conflicting with each other and with the different aspects (dimensions) of IWRM (Savenije & Van der Zaag, 2002)

The Southern Africa Vision for Water has been formulated as a desired future characterised by:

> Equitable and sustainable utilisation of water for social, environmental justice, regional integration and economic benefit for present and future generations.

And the South Africa white paper on water resources has been succinctly summarised as follows:

> "Some (water) for all for ever."

5 Sustainability of water resources (Savenije, 2000)

Since the appearance of the Brundtland report "Our Common Future" (WCED, 1987), sustainable development has been embraced as the leading philosophy that would on the one hand allow the world to develop its resources and on the other hand preserve unrenewable and finite resources and guarantee adequate living conditions for future generations.

Presently the definition most often used of sustainable development is: the ability of the present generation to utilise its natural resources without putting at risk the ability of future generations to do likewise. The president of Botswana K. Masire stated:

> "Our ideals of sustainable development do not seek to curtail development. Experience elsewhere has demonstrated that the path to development may simply mean doing more with less (being more efficient). As our population grows, we will certainly have less and less of the resources we have today. To manage this situation, we need a new ethic, one that emphasises the need to protect our natural resources in all we do." (cited in Savenije, 2000)

Sustainable development is making efficient use of our natural resources for economic and social development while maintaining the resource base and environmental carrying capacity for coming generations. This resource base should be widely interpreted to contain besides natural resources: knowledge, infrastructure, technology, durables and

human resources. In the process of development natural resources may be converted into other durable products and hence remain part of the overall resource base.

Water resources development that is not sustainable is ill-planned. In many parts of the world, fresh water resources are scarce and to a large extent finite. Although surface water may be considered a renewable resource, it only constitutes 1.5% of all terrestrial fresh water resources; the vast majority is groundwater (98.5%) part of which - at a human scale - is virtually unreneweable. Consequently, there are numerous ways to jeopardise the future use of water either by overexploitation (mining) of resources or by destroying resources for future use (e.g. pollution).

Physical sustainability

Physical sustainability means closing the resource cycles and considering the cycles in their integrity (water and nutrient cycles). In agriculture this implies primarily closing or shortening water and nutrient cycles so as to prevent accumulation or depletion of land and water resources: Water depletion results in desertification. Water accumulation into water logging. Nutrient depletion leads to loss of fertility, loss of water holding capacity, and in general, reduction of carrying capacity. Nutrient accumulation results in eutrophication and pollution. Loss of top-soil results in erosion, land degradation and sedimentation elsewhere. Closing or shortening these cycles means restoring the dynamic equilibria at the appropriate temporal and spatial scales. The latter is relevant , since at a global scale all cycles close. The question of sustainability has to do with closing the cycles within a human dimension.

Economic sustainability

The economic sustainability relates to the efficiency of the system. If all societal costs and benefits are properly accounted for, and cycles are closed, then economic sustainability implies a reduction of scale by short-cutting the cycles. Efficiency dictates that cycles should be kept as short as possible. Examples of short cycles are: water conservation, to make optimum use of rainfall where it falls (and not drain it off and capture it downstream to pump it up again); water recycling at the spot instead of draining it off to a treatment plant after which it is conveyed or pumped back over considerable distances etc.

Strangely enough, economic sustainability is facilitated by an enlargement of scale through trade in land- and water-intensive commodities (the "virtual" water concept). The use of virtual water is an important concept in countries where the carrying capacity of a society is not sufficient to produce land and water intensive products itself.

The closing of cycles should be realised at different spatial scales:

- The rural scale, implying water conservation, nutrient and soil conservation, prevention of over-drainage and the recycling of nutrients and organic waste.
- The urban scale, both in towns and mega-cities, implying the recycling of water, nutrients and waste.

- The river basin scale, implying: soil and water conservation in the upper catchment, prevention of runoff and unnecessary drainage and enhancement of infiltration and recharge, flood retention, pollution control and the wise use of wetlands.
- The global scale, where water, nutrient and basic resource cycles are integrated and closed. The concept of virtual water is a tool for an equitable utilisation of water resources. This requires an open and accessible global market and the use of resource-based economic incentives such as resource taxing ("Green tax" which taxes the use of non-renewable or finite resources), as opposed to taxing renewable resources such as labour, which is the general practice today.

6 Institutional aspects of Integrated Water Resources Management

The growing complexity of water management induces a need for management at the lowest appropriate level (also known as the 'subsidiary principle'), resulting in central government *delegating* functions to the decentralised organisational (regulatory) and operational levels. In general, the organisational (or regulatory) level may have a mandate over a river basin, while at the operational level concessions may have been delegated to sub-catchment areas or to user groups (municipalities, irrigation districts).

Thus, in managing the resource, a functional differentiation is made between constitutional issues (related to property rights, security, arbitration), organisational issues (regulation, supervision, planning, conflict management), and operational issues (water provision etc.) (World Bank 1993).

These issues will then be handled at three different levels:

- Constitutional level: the activities being governed by conventions of international organisation, bilateral or multilateral treaties and agreements, the national constitution, national legislation or national policy plans.
- Organisational level: activities at this level are defined by (federal) state regulation, ministerial regulation, regulation or plan of functional public body (national water authority, (sub) catchment authority), provincial regulation or plan.
- Operational level: activities being governed by subcatchment-, district-, town regulations, bye-laws of semi-public or private water users organisations etc.

The most important issue in dealing with water resources is to ensure an institutional structure that can coordinate activities in different fields that all have a bearing on water. *Linking structures* are crucial.

Through a process of vertical and horizontal coordination it is possible to integrate different aspects of the water issue at different levels. Linking can be facilitated if a country's water is managed following hydrological boundaries (river basins, which may be subdivided into catchment areas and sub-catchments).

Once agreement exists over what type of functions and decisions can best be made at what level, a next policy option is that of privatisation. Operational functions often involve the provision of specific services in water sub-sectors, such as irrigation and drainage, water supply and sanitation, and energy. The production function may, in principle, be privatised; but only if the nature of the good (or service) is fit for it, and if government's regulatory capacity is strong enough to prevent monopoly formation or other market failures.

Financial and economic arrangements are complex issues. The maxim 'water is an economic good and should be priced according to the principle of opportunity costs', as well as the 'users pays and polluter pays' principles carry within them a danger, especially in countries lacking sufficient resources and with a skewed distribution of wealth. In such countries the 'user pays' principle may boil down to 'who can pay is allowed to use or pollute water'. Because of historically grown inequities in society, this may result in a large group of the population having limited access to water resources. This often creates severe social problems, and should be considered unconstitutional, as it violates a first order principle (equity).

Therefore a balance has to be found between water pricing which ensures economic sustainability on the one hand, and the social requirement of sufficient access to clean water, on the other (i.e. efficiency versus equity).

Instruments that may assist in achieving a balance between efficiency and equity include:

- recovery of real costs by functional (catchment) agencies;
- financial independence (and accountability) of implementing agencies;
- water pricing by means of increasing block tariffs, and other forms of cross-subsidies.

A wider concept than water pricing and cost recovery is *demand management*, which is the use of economic and legal incentives in combination with awareness raising and education to achieve more desirable consumption patterns, both in terms of distribution between sectors and quantities consumed, coupled with an increased reliability of supply.

In fact, good water management should mean a continuous process of *'integrated demand and supply management'*, which would seek to match supply with demand through reducing water losses, increasing water yield and decreasing water demand (Savenije and Van der Zaag, 2000).

Environmental sustainability need not conflict with the principle of economic sustainability in a sense that uneconomic activities often waste water resources, if not the resource base itself. In addition, environmental costs or 'environmental externalities' should be clearly accounted for in economic impact assessments, although this is often not properly done. This points to the need for integrating the assessment tools, as suggested by UNEP (1997): assessments have to be carried out of the likely **e**nvironmental, **e**conomic, and **e**quity impacts of any water resources measure or development, the so-called **EIA**^{3}. The vital inclusion of land use appraisal in water management assessment studies is often also omitted. Experiences in the field of

environmental protection or environmental reconstruction show that positive incentives (e.g. subsidies) for practices that restore the ecology are rendering more effect than negative incentives (sanctions, fines) on practices that damage the environment.

Another prerequisite for success is the involvement and participation of water users and other stakeholders. Control without consensus is hard, if not impossible, to reach. The basic premise should be: those who have an interest in the water resource and benefit from it have the duty to contribute to its management and upkeep (in money and/or in kind) and have the concomitant right to participate in decision-making. This leads to the maxim of the water boards in The Netherlands: *interest - taxation – representation*.

Moreover, the wider public may play an important role in the difficult process of monitoring this fluid and fugitive resource. Formalising the role of interest groups can be realised by applying a comprehensive system of integrated planning at various levels, but at least at the organisational level.

Even a perfect legal and institutional framework (provided that this may ever exist) cannot function without motivated people with sufficient awareness, know-how and skills. Human resources are scarce. It requires investment in (further) training to build up and maintain the resource.

7 Strategic issues in water resources management

Current thinking on the crucial strategic issues in water resources is heavily influenced by the so-called Dublin Principles, which were formulated during the International Conference on Water and the Environment in Dublin, 1992, as a preparation for the UN Conference on Environment and Development (UNCED) in Rio de Janeiro the same year. During the Rio conference, the concepts of Integrated Water Resources Management were widely discussed and accepted (Table 2).

Table 2 Dublin Principles (ICWE, 1992)

- Water is a finite, vulnerable and essential resource which should be managed in an integrated manner
- Water resources development and management should be based on a participatory approach, involving all relevant stakeholders
- Women play a central role in the provision, management and safeguarding of water
- Water has an economic value and should be recognised as an economic good, taking into account affordability and equity criteria.

Associated key concepts:

- Integrated water resources management, implying:
  - An inter-sectoral approach
  - Representation of all stakeholders
  - Consideration of all physical aspects of the water resources
  - Considerations of sustainability and the environment
- Sustainable development, sound socio-economic development that safeguards the resource base for future generations
- Emphasis on demand driven and demand oriented approaches
- Decision-making at the lowest possible level (subsidiarity)

Consensus over several issues have emerged in the last few years:
- In terms of water allocation, basic human needs have priority; other uses should be prioritised according to societal needs and socio-economic criteria
- The river basin is the logical unit for water resources management
- Participatory approaches in decision-making, and the crucial role of women.

There are a number of important outstanding issues of debate:
- Privatisation, and more generally the role of the private sector in water management
- The value of water (the social, economic and ecological value)
- The pricing of water (whether we should price basic needs, and if so, how we can safeguard access to water by the poor)
- Water for food (potential conflict between irrigation and ecological water demands and the scope for improving rainfed-agriculture)
- Non-water borne sanitation or traditional water borne end-of-pipe sanitation

It is obvious that these remaining issues are very important strategically. Countries are currently dealing with them individually. It is sometimes feared that outside pressure may in cases lead to countries making the wrong decision, and by so doing jeopardising fundamental policy principles. This may, for instance, be the case when a water utility is privatised without the country having an effective regulatory body to supervise the operations of the privatised utility.

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B 1.2

Water allocation

Code	B 1.2
Teaching topic	Water allocation
Time (hrs)	2
Content/Skill focus	Water allocation
Objectives	1. To gain insight into key issues in water allocation in general 2. To understand the main issues in the allocation of shared water resources
Learning methodology	Conventional lecture; enlightened with many examples drawn mainly from Southern Africa
Trainer/facilitator guide	- general (balancing demand- supply; scales, boundaries; uncertainty; efficiency and equity; water losses) - water allocation between sectors - legal aspects in water allocation - conflicts over shared water resources - trends in the allocation of shared waters
Course book	P. van der Zaag: “Water allocation: some general considerations”
Course reader	F. Jaspers: “Principles of water allocation in historic perspective"
Further reading	Savenije, H.H.G., & P. van der Zaag, 2002, Water as an economic good and demand management; paradigms with pitfalls. *Water International* **27**(1): 98-104

Water Allocation: some general considerations

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1 Introduction

The purpose of the allocation of water to different users is to match or balance the demand for water with its availability. There are various ways how to allocate water. The challenge is to find an optimal allocation that, firstly, adheres to laid-down legal and other regulations, and secondly, satisfies the water demand of all users as much as possible. Or,

> "to balance properly between a whole set of obligations: to international conventions, to human basic rights for wellbeing of both upstream and downstream societies, for protection of land productivity, for delivery of ecological goods and services from both terrestrial and aquatic ecosystems, and for resilience of ecosystems to both natural and man-made disturbances." (Falkenmark and Folke, 2001)

Water allocation is not an issue when water availability far surpasses the demand. In such situations all demands can be satisfied, and in fact there is no need for a regulated allocation of water. In many catchment areas and parts of river basins, however, water availability is frequently less than the demand for it. It is then necessary to find a suitable allocation of the scarce water.

Water allocation is not only concerned with the physical allocation of water. More broadly it is about satisfying conflicting interests depending on water. These may be functions derived from water such as navigation (navigability, minimum water levels), hydropower (head difference), environment (a water regime of water level fluctuation), recreation (availability of water but non-consumptive), etc. These functions are only to a certain extent consumptive, but can be conflictive in their timing and spatial distribution. Also flood protection is a function of the water resources system that related to the water resources. Flood protection through the construction of storage dams can have a positive impact on water availability for other functions (e.g. hydropower), but can have negative impacts on others (e.g. on the environment).

2 Balancing demand and supply

Finding a suitable allocation key for water can be quite complex, since a large number of parameters have to be considered, both on the supply- and the demand-side.

Supply
- The generation of water in a catchment area naturally fluctuates, both within years and between years.
- Water occurs in different forms, which often have different uses. Special reference is made to rainfall and its use as "green water" in agriculture. Green water cannot be allocated in the same way as "blue" water occurring in rivers and aquifers. Yet, dryland agriculture and other types of land use do influence the partitioning of rainfall into groundwater recharge, surface runoff and soil moisture (i.e. evaporation and transpiration), and hence their availability.

Demand
- The demand for water fluctuates, but normally much less than its generation. For many types of uses, water demand increases when water availability decreases, such as during the dry season.
- Many water uses are (partially) consumptive, meaning that the water abstracted will not return to the water system in the form of "blue water"; consumptive water use typically converts blue or green water into water vapour, which in this form cannot be allocated to other users.
- Water uses that are non-consumptive allow others to use the water afterwards. Recreational water uses are a typical example. However, some non-consumptive uses alter the time when this water becomes available for other users. A typical example is water used for the generation of hydropower: electricity is needed also during the wet season, and thus water has to be released from dams for this purpose, when demand for it from other sectors may be low. As a result, this water used for electricity generation is unavailable to these potential uses when they need it. The environment is another (partially) non-consumptive user of water; its requirements are frequently out of sync with the needs of other users. (That is precisely why these environmental water requirements are now increasingly being recognised.)
- Many uses of water generate return flows, which, in principle, are available for other uses. However, return flows normally have a lower quality than the water originally abstracted. This may severely limit their re-use. Sometimes the quality of return flows is a hazard to public health and the environment.
- Different types of water use require different levels of assurance. For arable (non-perennial) irrigated crops, levels of assurance of 80% (i.e. a chance of failure in one out of five years) may be acceptable. For urban water supply assurance levels of 96% or higher are the norm (failing in one out of 25 years).

The legal framework

In many countries water is considered a public good. Here the water is owned by the citizens of a country, and the government manages this public good on their behalf. Laws and regulations will therefore provide the rules pertaining to the use of this public resource.

From a public to a private good
In countries where water is considered a public good, water allocation may be viewed as the process of converting a public good into a private one. An irrigator, for instance, will apply the water to his/her privately owned crop. The crop will consume a large part of the water, converting it into water vapour and increasing its yield. The irrigator derives direct and private benefit from using a public good, but in so doing s/he denies another person the opportunity to use that water and deriving similar private benefits.

Balancing supply and demand must be done within the established legal framework. A country's water law and subsidiary government regulations will prescribe many aspects of water allocation. Amongst these are:

- The law will prescribe the types of water use that are regulated and therefore require some kind of permit, concession, right etc.; and the types of water use that are not regulated and do not require permission. The use of water for primary purposes often does not require a permit or water right, just as the direct use of rainwater.
- A water permit or water right typically defines which water (groundwater, surface water) can be diverted, where (point of abstraction), and for which purpose (e.g. irrigation of *x* ha of land). A permit or right specifies certain conditions under which water use is permitted. A typical condition is that the permit or right is limited in that it does not permit the use of water that infringes on similar rights of others. Another condition frequently specified is that the water should be used beneficially and not be wasted, and that return flows should adhere to certain quality standards.
- The law often stipulates the hierarchy of different types of water use; distinguishing between, for instance, primary use, environmental use, industrial use, agricultural use, water for hydropower etc. In most countries water use for primary purposes has priority over any other type of water use. Some countries also specify a hierarchy of the remaining uses, whereby the most important economic use in that country normally receives a high priority of use. In other countries all uses of water other than for primary (and sometimes environmental) purposes have equal standing. In times of water shortage the amount of water allocated to all non-primary uses will be decreased proportionally, so that all these user share the shortage equally.

The law may provide more detailed stipulations with a direct bearing on the allocation of water. The law may stipulate, for instance, that the allocation of water should be equitable. In some countries, in contrast, the law directs that junior rights may not affect senior rights.

In most cases, however, the legal framework does not provide a detailed "recipe" of how the water should be allocated. The water manager will therefore have to interpret the more general principles as laid down in the law, and translate these into operational rules for day-today allocation decisions. In many countries the water manager may not even do this without consulting all relevant stakeholders.

The value of water

The various uses of water in the different sectors of an economy add value to these sectors. Some sectors may use little water but contribute significantly to the gross national product (GNP) of an economy. Other sectors may use a lot of water but contribute relatively little to that economy. For example, in Namibia, industry and commerce consume less than 3% of all water used, but contribute 42% to the Namibian economy. In contrast, irrigated agriculture uses 43% of all water used, but contributes only 3% to the economy (Table 1).

Table 1 The contribution of various sectors in the economy of Namibia to Gross National Product (GNP), and the amount of water each sector uses (Pallett, 1997: 102).

Sector	Water use ($Mm^3\ yr^{-1}$)	(%)	Contribution to GNP (%)
Irrigation	107	43.0	3
Livestock	63	25.3	8
Domestic	63	25.3	27
Mining	8	3.2	16
Industry & Commerce	7	2.8	42
Tourism	1	0.4	4
Total	249	100.0	100

Care should be taken to interpret the above data. For instance, it is well known that the agricultural sector typically has a high multiplier effect in the economy, since many activities in other sectors of the economy depend on agricultural output, or provide important input services (Rogers, 1998). The "real" value added by water may thus be underestimated by the type of data given in the table.
Box 1 provides some data on the added value of (irrigation) water for the production of maize in Zimbabwe.

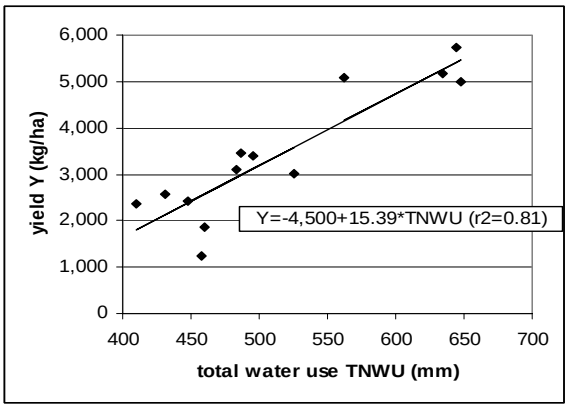
Box 1: The value of water for maize in Zimbabwe (see also Figure 1)

For selected plots in Nyanyadzi irrigation scheme, Pazvakawambwa and van der Zaag (2000) found that one additional m^3 of water (irrigation+rainfall) supplied to the maize crop (rainfed with supplementary irrigation) gave an added yield of 1.5 kg of maize m^{-3} (r^2 = 0.81). Assuming a maize price of 0.10 US$ kg^{-1}, it follows that the marginal value of water (rainfall+irrigation) is 0.15 US$ m^{-3}.

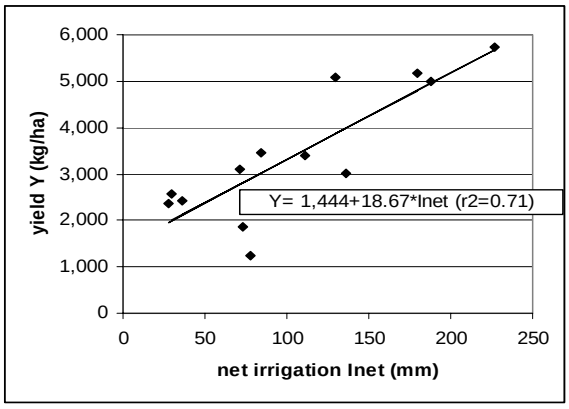
Yields were also correlated with net total irrigation water (*Inet* in mm). The following mathematical relationship was found:

$$Y = 1{,}450 + 19 * Inet \quad \text{(correlation coefficient } r^2 = 0.71\text{)}$$

The constant of 1,450 kg ha^{-1} indicates the yields obtainable for a rainfed crop without irrigation. The marginal productivity of net summer supplementary irrigation water was 19 kg ha^{-1} mm^{-1}, or 1.9 kg m^{-3}. This means that 1 m^3 of supplementary irrigation water will produce an additional 1.9 kg of maize, which is valued at US$ 0.19. The marginal value of supplementary irrigation for maize in Nyanyadzi is therefore 0.19 US$ m^{-3}.



(a) total net water use and yield



(b) net irrigation water and yield

Figure 1: Relationship between water use and yield for maize, Zimbabwe

The added value of some uses of water are very difficult, if not impossible, to measure. Consider for instance the domestic use of water: how to quantify the value of an adequate water supply to this sector?

The damage to an economy by water shortage may be immense. It is well known, for instance, that a positive correlation exists between the Zimbabwe stock exchange index and rainfall in Zimbabwe. The drought of 1991/92 had a negative impact on the Zimbabwean economy (Box 2). Likewise, the February 2000 floods had a huge negative impact on Mozambique's economy (Box 3).

Box 2: The impact of drought in Zimbabwe

During the drought of 1991/92, the country's agriculture production fell by 40 % and 50% of its population had to be given relief food and emergency water supplies, through massive deep drilling programmes, since many rural boreholes and wells dried up. Urban water supplies were severely limited with unprecedented rationing. Electricity generation at Kariba fell by 15% causing severe load shedding. As a result its GDP fell by 11%.

Box 3: The floods of February 2000 in Mozambique (Brito, 2002)

Heavy rains, which started in early February 2000, flooded parts of Mozambique's southern provinces. The Save, Limpopo, Incomati and Umbeluzi rivers, which have their head-waters in Zimbabwe, Botswana, South Africa and Swaziland, reached their highest-ever recorded levels in early March, and many riparian communities were submerged for weeks. 699 people died, 95 disappeared, and one million people required some form of emergency assistance.

Large sections of the major road connecting Maputo to the north were demolished. Bridges along the Limpopo flood plain and the railroad were damaged. About 20,000 cattle drowned and 140,000 hectares of crops were destroyed, with the largest irrigation scheme in the country (25,000 ha, along the Limpopo) seriously damaged. Health centres as well as water supply and sanitation infrastructure in many towns and villages suffered extensive damage, exposing one million people to water-borne diseases such as cholera, malaria and diarrhoea. The destruction caused by the floods is estimated at US$ 600 million. Mozambique's economic growth went down from 10% in 1999 to 2% in 2000.

Scales and boundary conditions

Any allocation decision potentially has third party effects: it may affect those not immediately involved in the allocation process, either beneficially or detrimentally. A special case, and a very important one, is where downstream users are affected that are located outside the jurisdiction of a given water allocation institution.

Any allocation process that does not encompass the entire river basin runs the risk of being affected by upstream uses and in turn impacting on downstream uses. Since most river basins are simply too large in extent, and often shared by more than one country, the water allocation processes is normally fragmented into catchment areas which form part of the larger basin. In such cases the allocation process must include boundary conditions; i.e. a specification of water requirements at the inlet and at the outlet of the catchment area under consideration. Even a most downstream catchment area, with its downstream boundary being an estuary, will have to set such boundary conditions so as to minimise salt intrusion, and/or ensure the health of the estuary for environmental, social and/or economic purposes (e.g. for mangrove forests and prawn fisheries).

Boundary conditions are especially important in river basins that are shared by more than one country. If an upstream water allocation institution does not consider the requirements of the downstream country, it may even affect the bilateral relations of the two neighbouring countries.

It would be advisable to formalise such boundary conditions in writing and to get them endorsed by all water allocation institutions involved; in a similar manner as how claims of individual water users are formalised in water permits or rights.

The water allocation process should ideally consider both the detailed allocation decisions between individual water users at the local level, as well as the "big picture" allocation decisions covering the entire river basin. Obviously, these different spatial scales require different levels of accuracy and specificity. But they are both required, since decisions at these different spatial scales affect each other. In practice, the decision-making process has been iterative, with an initial focus on the smaller spatial scales, especially in heavily committed parts of a basin. With the steadily increasing pressures on our water resources, the interconnectedness between the various parts of the basin have become apparent in many river systems. This has inevitably led to widening the scope of the water allocation process also to the largest spatial scale.

3 Issues in water allocation

In this section some important issues directly related to water allocation are briefly discussed. These issues typically cannot be solved overnight. Any actor involved in water allocation, however, must be aware of them.

1. Defining key concepts

Key concepts used in a country's water allocation system must be very precisely and clearly defined, and be known and understood by the water users. Such key concepts may include: the ownership of water, water use, primary use, equity, efficiency, and the precise rights and obligations conferred with a water permit.

A particularly important issue is the definition of water use, since this basically defines the point where water converts from a public to a private good. Lack of clarity about where exactly this conversion occurs will create confusion, which will directly impact on the effectiveness of the water allocation process. For instance, if a permitholder has lawfully stored water in his/her dam, has this water already been used and hence is owned by the permitholder, or not yet?

Water use
The South African Water Act defines water use as taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (declared activities which impact detrimentally on a water resource), altering a watercourse, removing underground water for certain purposes, and recreation.

2. Uncertainty

Generally speaking, if a user does not know how much water he or she is entitled to, and how much water is likely to be available at a future time, he or she tends to over-use or hoard water often at considerable losses.

The allocation of water over different uses should therefore aim to effectively deal with uncertainty and increase the predictability of water available to the various uses. Increased predictability is an important condition that will allow users to use water more efficiently. Even a better understanding of how *unpredictable* water availability is will improve a user's ability to deal with this.

Two types of uncertainty may be distinguished: physical uncertainty and institutional uncertainty.

Physical uncertainty
Physical uncertainty does not so much refer to the stochastic nature of hydrological processes (which is normally quite well understood), but more to the impact of human activities on the hydrological cycle. At the global level, human-induced climate change is a possibility and may have wide-ranging effects, but the specific effects are not yet

well understood. At a smaller spatial scale, the effects of land use change on the availability of blue water are difficult to predict. Will a more efficient use of soil moisture for rainfed crop production indeed translate into decreased blue water flows? A bit more straightforward is the link between groundwater and surface water abstraction; but still it is difficult to predict the precise effect of groundwater abstraction in a given location on the surface water availability somewhere downstream.

The physical uncertainties mentioned here must be acknowledged. If a proper understanding of such processes is lacking, in the first instance conservative estimates should be made on possible impacts of certain interventions. The water management agency should then put in place a programme of data collection meant to gradually improve the understanding of these dynamic processes.

Institutional uncertainty
A different type of uncertainty is created by the institutions that are involved in water allocation. If the manner in which such institutions allocate water is unknown to the users or ill-understood by them, or seen as haphazard, then users may distrust the allocation process. They will receive the wrong (perverse) incentives to, for instance, overstate their water requirements, hoard water or even over-use it.

The institutional system of water allocation should therefore be predictable to users. All users should know the principles and procedures guiding the allocation of water. Moreover, the allocation process must treat all users in the same way. It must also be transparent, and information on permits granted or permits refused must be freely accessible, not only to all water users, but to the wider public as well. A fair and transparent allocation process will enhance the individual users' trust in the process, and will increase their confidence in the worth of their permits/rights to use water. Trust in the allocation process will enhance users willingness to invest in water related infrastructure, and desist from "free-rider behaviour" in times of water scarcity.

3. Efficiency and equity

It could be argued that Postel's three ***E***s (Equity, Efficiency and Ecological integrity) should form the pillars of any water management activity. Since water allocation is a major water management activity, following this line of argument the three ***E***s should also inform water allocation decisions. Suppose now that the environmental/ecological water requirements are adequately taken care of, by assigning to the environment rights to sufficient water with an acceptable ecological regime. Then two ***E***s remain, i.e. equity and efficiency.

Some people believe that there is a trade-off between the principles of equity and efficiency; i.e. a more efficient allocation system may ignore certain issues of equity, and vice versa, a more equitable allocation system may be less efficient. This is not necessarily true for all situations. Here some tentative definitions are given, and some implications for water allocation briefly explored.

Equity
Equity can be defined as affording everyone a fair and equal opportunity in the utilisation of the resource according to one's needs. Equitable access does not necessarily mean access to equal quantities but rather equal opportunity to access water (WRMS, 1999). Equity deals with the distribution of wealth or resources among sectors or individuals of society.

Efficiency
Different definitions of efficiency can be used, depending on one's objective. The reason why efficiency is important is that water is a finite and often scarce resource. Generally, efficiency measures how much one can do with one unit of water. Economic efficiency would then measure the benefits derived from a unit volume of water used. Water use efficiency measures the amount of water actually used for a given use.

At a more abstract level, efficiency can also indicate to what extent the ensemble of technical, legal, institutional, economic and other measures induce efficient use of the scarce water. For instance, certain legal and institutional arrangements may enhance people's willingness to privately invest in water infrastructure, or induce them to waste less water, or pollute less. This will eventually lead to increased water use efficiency as well as increased economic efficiency.

This wider definition of efficiency calls for pricing arrangements that ensure cost recovery of water services. This will not only give the correct signal to water users, namely that water is valuable and should not be wasted, but will also lead to the sustainability of infrastructure and institutions. The wider definition of efficiency also calls for suitable legal arrangements that provide users with sufficient security of water tenure, such that they are willing to invest in water-related infrastructure.

[Note:
We prefer this wider definition above a narrow economic interpretation. Such an interpretation usually states that the marginal benefit from the use of the resource should be equal across use sectors; if not, society would benefit more by allocating more water to the sector where the benefits will be highest (the so-called Pareto optimum). In our view, such a Pareto optimum is not likely to exist, since different uses of water require different levels of assurances. See below.]

Trade-offs
The principle of economic efficiency is often translated into proper pricing of water services. This may obviously jeopardise the equity principle, in that poorer households may not be able to buy such a service. The fact that poorer households are thus denied access to a basic amount of water may however be extremely costly to society, in terms of disease, ill health etc. From a societal perspective it may therefore be highly efficient to provide all households with a very cheap (subsidised) lifeline quantity of water, and to make up the financial shortfall through cross-subsidies. In this manner win-win combinations of efficiency and equity in water allocation systems may be achieved.

4. Water losses

Reducing water losses often has a high priority in attempting to balance demand with supply. However, water losses should always be carefully and precisely defined. This is because it depends on the scale and the boundaries whether water is considered a loss or not. At the global scale no water is ever lost. At the scale of an irrigation scheme, a water distribution efficiency of 60% indeed means that 40% of the water is lost. Part of this water, however, may return to the river and be available to a downstream user. At the scale of the catchment, therefore, it is the transpiration of crops (the irrigation water effectively consumed by the crop, or 60% in this example) that can be considered a loss!

In many situations, and especially in irrigated agriculture, a reduction of water losses may not free up the "saved" water. Even "real" water losses, such as when water is released from a dam through the river bed for a downstream user, may provide an important service; namely recharge of aquifers, water for the environment etc. Once such services are recognised and formalised into permits (or in a "Reserve", as done in South Africa), the water manager may sometimes be able to find interesting win-win solutions. In other cases, of course, this may not be possible.

Analysing water losses should therefore always:
- clarify the scale and boundaries at which the analysis is done
- acknowledge both the consumptive and non-consumptive parts of the water use under consideration
- consider any other type of use (including the environment) that may benefit from the water "lost".

5. Water allocation between sectors (Savenije and Van der Zaag, 2001)

As was noted earlier, some types of water use add more value than others. The classic case is the different values attained in the agricultural and urban sectors: the value attained in urban sectors is typically an order of magnitude higher than in agriculture (Briscoe, 1996).[2] If water is currently used in the agricultural sector, the opportunity cost, i.e. the value of the best alternative use, may be 10 times higher, subject of course of "location and the hydraulic connections possible between users" (Briscoe, 1996). Thus a shift towards the higher value use is often promoted.

Whereas the opportunity cost of water for domestic water use may be highest, the moment availability is higher than demand, the opportunity cost of the water will fall to the next best type of use. It is just not possible to consume all the water at the highest value use. The proper opportunity cost for irrigation water may therefore be only half, or less, than the best alternative use (Rogers et al., 1997). Even then the reliability of supply acceptable to irrigated agriculture is much lower than that for urban water supply: a storage dam yielding x m^3 of water supplied to irrigation at 80% reliability, may yield only $0.5x$ m^3 (or more or less, depending on hydrology) for urban water

[2] However, in economies with many industries depending on the agricultural sector, the multiplier effect of agricultural production is high, and therefore the value added by water may be under-estimated when only using farm-gate prices of agricultural produce (Rogers, 1998).

supplied at 95% reliability. The effective opportunity cost of water used for irrigation should therefore again at least be halved. The resulting opportunity cost is thus only a fraction of what some neo-classical economists claim it to be.

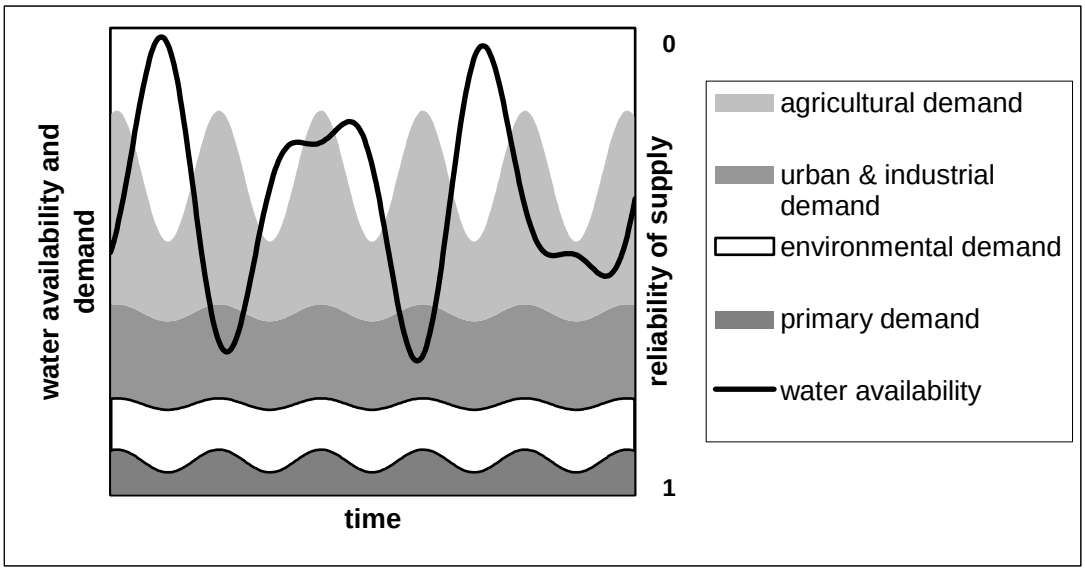


Figure 2 Variation of water availability and demand, and reliability of supply

Figure 2 illustrates the variation of supply and demand in an imaginary case. It shows that, in general, primary (domestic) and industrial demands, with the highest ability and willingness to pay, require a high reliability of supply, which is normally achieved through relatively large storage provision. Also environmental demands are not the most demanding on the resource. Agricultural water requirements tend to be much higher, fluctuate strongly but also accept a lower reliability of supply.

The emerging picture, then, is fairly straightforward and common sense: the sectors with highest value water uses should have access to water. In many countries these sectors require only 20-50% of average water availability, and these demands can easily be satisfied in all but the driest years. In most years much more water will be available, and this water should be used beneficially, for instance for irrigation. There is therefore no need for *permanent* transfers from agriculture to other sectors, except in the most heavily committed catchment areas of the world. What is needed is a legal and institutional context that allows *temporary* transfers of water between agriculture and urban areas in extremely dry years. No market is required to cater for such exceptional situations. A simple legal provision would suffice, through which irrigators would be forced to surrender stored water for the benefit of urban centres against fair compensation of (all) benefits forgone.

In those heavily committed catchment areas where permanent transfers of water out of the agricultural sector are required, normally voluntarily negotiated solutions can be agreed, provided the laws allow this to happen. Rosegrant and Gazmuri (1996: 276-77) report a case of a factory financing the construction of a water-saving drip irrigation system for an irrigation scheme, thereby obtaining the right to use the water thus saved.

6. Do higher value uses of water need to have priority over lower value uses?

No, not necessarily. Higher value uses (such as urban water use) often have the potential to mobilise sufficient financial resources to secure a reliable supply. Higher value uses often require higher levels of reliability, meaning larger dams, and hence much larger investments, compared with lower value uses (e.g. irrigation). Often, the higher value uses are able to mobilise even these higher investment requirements. In such cases, it is not necessary to give higher value uses priority over lower value uses. The obvious economic advantage to society of not giving priority to various non-primary uses, is, that sectors have to fend for themselves, and will not, in all but the most extreme droughts, damage each other.

As said earlier, in extreme cases of drought, transfers between sectors will have to be against fair compensation.

4 Conclusion

There is not one best way to balance water demand with water availability. This balancing act is basin and catchment-specific. It is also clear that the balancing act will often involve a process of decision-making where difficult compromises have to be made. Another course module (water resources analysis and planning) provides tools to assist with these decision processes.

In all cases, the water allocation process requires a sound quantitative understanding of both water availability and water demand. Water availability will be thoroughly dealt with in other course modules (e.g. hydrology). Water demand of different sectors are dealt with in subsequent chapters of this lecture note.

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B 1.3

Water quality and environmental issues in international rivers

Code	B 1.3
Teaching topic	Water quality issues in international rivers
Time (hrs)	1
Content/Skill focus	Environmental and water quality issues in international rivers
Objectives	To gain a broad understanding of the importance of environmental and water quality aspects in shared rivers
Learning methodology	Conventional lecture; enlightened with examples drawn from the river Rhine and other cases
Trainer/facilitator guide	- Basic issues - The importance of monitoring and data sharing - Standards for water quality and environmental water requirements
Course book	P. Kelderman: “Water quality and environmental issues in international rivers”
Course reader	
Further reading	

Water quality and environmental issues in international rivers

Peter Kelderman, UNESCO-IHE Delft

1. Aspects of water quality

Water is a scarce resource and the potential for deterioration is greatly affected by the (lack of) economy in its use. On a global scale, agriculture is by far the largest water user, through irrigation. From 1940 - 2000 a 5 times increase in water use has taken place in the world; thus more efficient irrigation and conversion to less water demanding crops can be very efficient means of water control.

On a global scale, the present stages of water pollution show a strong dependence on socio-economic development, with a clear time lag between the situation in developed vs. developing countries (see Fig. 1). Whereas the problems with domestic water pollution are largely solved in many parts of the “developed world”, this is not the case for less developed countries. Also, in the coming decades, the “rapidly developing countries” will be faced with virtually all water pollution problems at the same time.

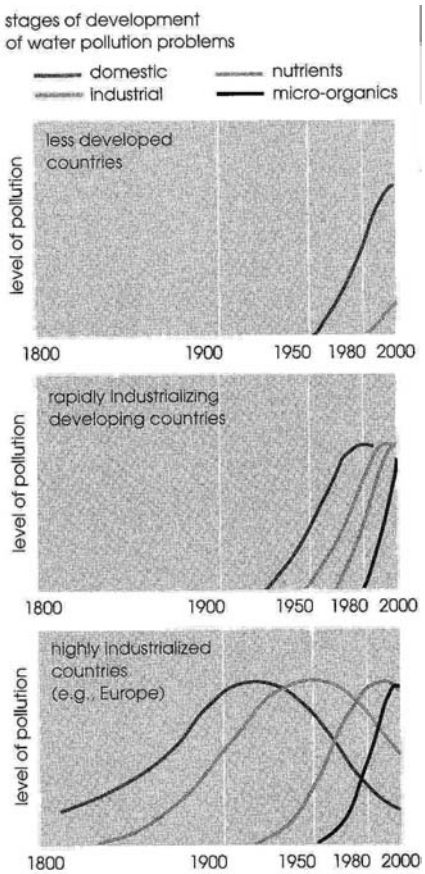


Figure 1: Stages of development of global water pollution problems

On a global scale, a strong increase can be observed in water pollution problems especially in (rapidly) developing countries, due to *e.g.*:

- Increased population and urbanization, leading to domestic and industrial wastes, polluted drinking water, *etc.*;
- Increasing industrial developments;
- Deforestation, leading to increased erosion and leaching of soils;
- Intensified agriculture with resulting over-irrigation, increased fertilizer and pesticide usage;
- Engineering works, such as the damming of rivers and the destruction of wetlands.

It is apparent, that the above problems are often greatly enhanced by a lack of legislation, organization and finance.

2. Water pollution parameters

Water pollution is often expressed in terms of specific technical terms and categories. Main categories of water pollution parameters include:

Table 1: Different categories of pollution and their effects

Category	Effects
Biochemical Oxygen Demand (BOD)	Anaerobic waters, stench, fish kills.
Nutrients (P, N)	Eutrophication in lakes and rivers
Heavy metals; **organic micropollutants**	"Bioaccumulation"; large toxicity
Microbial pollution	Health risks

(DEGRADABLE) ORGANIC MATTER

Organic matter may enter a river mainly from domestic and industrial sources. The organic matter can be broken down by **microbes**, with the help of **oxygen.** As a result, the oxygen levels decrease, leading to environmental problems (dying fish, for example).

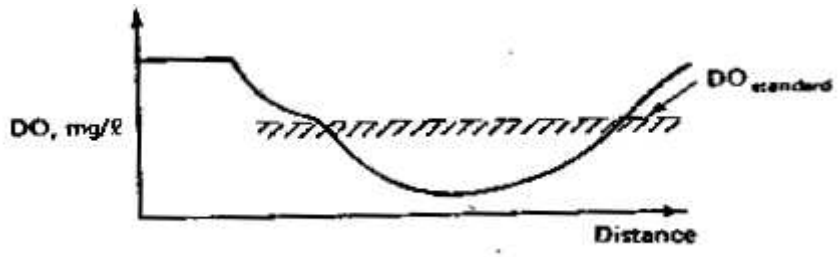


Figure 2: Change of dissolved oxygen (DO) levels along a river stretch as a result of organic pollution

Following an organic waste discharge, the dissolved oxygen concentration in a river typically decreases, followed by a recovery caused by the re-aeration from the atmosphere. The oxygen minimum may be reached some 50 km's from the organic waste discharge; thus the effect of the discharge is often a interregional or even international problem.

The amount of organic waste load can be expressed as an “oxygen demand" (Lamb, 1985). The oxygen demand can be measured in the laboratory in various ways.

A widely used parameter is known as **BOD** or Biochemical Oxygen Demand. This can be measured in the laboratory by microbial decomposition under standardized conditions (temperature, time), *e.g.*:

BOD_5^{20} : BOD during 5 days at 20^0 C.

NUTRIENTS IN SURFACE WATERS

Nutrients such as nitrogen (N), phosphorus (P) and silicon (Si) are essential for the growth of algae; however an overdose of these nutrient may give **eutrophication**, especially in lakes. This results into a “pea soup” appearance of the lake water, with low light penetration. Further, this phenomenon may cause large problems in the preparation of drinking water.

Sources of nutrients include:

a) Domestic and industrial **point sources**. Due to sanitation of the waste streams, the point sources for nutrients are decreasing, especially in developed countries where more and more use is being made of nutrient removal from wastewater, in so-called tertiary treatment (see section 3).

b) **Non point sources** such as agricultural run-off**.** Both in developed and in developing countries a strong increase in fertilizer usage can be observed (though the absolute values are still very different, *e.g.* the Netherlands: 250 kg/ha; developing countries: usually < 5 kg/ha).

MICRO-POLLUTANTS

This category includes heavy metals (such as mercury, cadmium and lead), and organic micro-pollutants, *e.g.* DDT and PCBs. Most of the environmental loading is man-made, though heavy metals may sometimes have natural high background values.

Some sources of micro-pollutants are:

- Industrial discharges;
- Traffic and other combustion sources ;
- Agriculture, *e.g.* pesticides such as DDT, dieldrin and aldrin. Nowadays these persistent (non-biodegradable) pesticides have, in many countries, been replaced by more degradable compounds such as malathion and parathion.

The pollution of micro-pollutants is still most prominent, though decreasing, in developed countries; developing countries show a markedly increasing trend.

Both heavy metals and (non-polar) organics have a strong tendency to be adsorbed onto **sediments** and into organisms' **fatty tissue**, and thus to be accumulated into the food chain, see Figure.3.

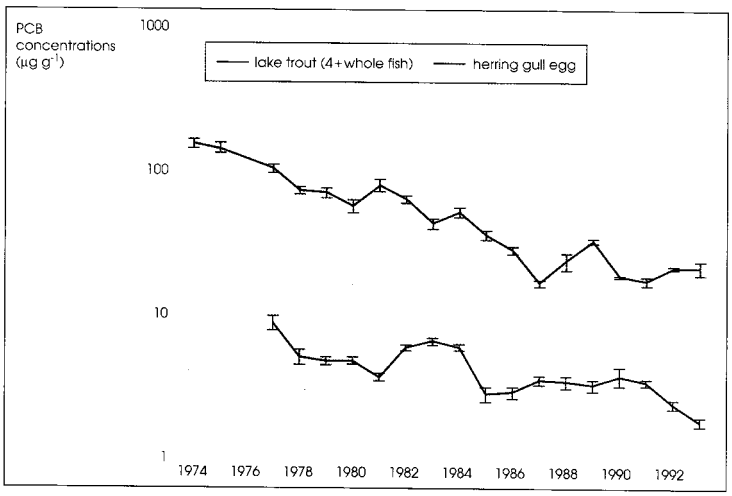


Figure 3: PCB concentrations in lake trout (bottom graph) and bird eggs (top graph) from Lake Ontario, Canada (Source: GEMS Water Programme).

3. Wastewater treatment

Poorly treated wastewater are a source for surface and ground water pollution; they may induce water borne diseases, stench and fish kills. Since the last century, techniques of sewage treatment have been applied for the removal of suspended solids (SS), BOD, nutrients, pathogens and other components in the wastewaters.

For domestic wastewater, the waste load per person per day is commonly expressed in the unit **population equivalent** (p.e.). This unit is also used for non-domestic wastewater, *e.g.* for a factory "having a waste stream equivalent to 10^6 p.e.". A typical composition of wastewater is as follows (*N.B.* in countries with low water usage, the concentrations will be higher):

Table 2: Typical composition of wastewater

Suspended solids (SS)	200 mg/L
BOD_5^{20}	200
COD	400
total-N	40
NH_4-N	25
PO_4-P	5-10

Conventional wastewater treatment is specifically aimed at physical and microbiological removal of the suspended solids and the BOD from the wastewater:

1) Removal of larger debris and sand, followed by
2) Primary sedimentation of the suspended solids, in a sedimentation basin;
3) Removal of BOD by microbial decomposition under aerobic conditions; for this an "activated sludge unit" is commonly used, where a high population of active bacteria breaks down the BOD, under forced aeration;
4) A final sedimentation step before discharging the effluent.

In above conventional "secondary treatment " (*N.B.* primary treatment would only involve SS removal, by sedimentation), removal efficiencies for SS and BOD of *ca.* 90% can easily be reached. Compared to this, the removal of N and P is much less effective, *viz.* 20-40%.

These values can be improved in so-called "tertiary treatment" steps.

4. Water quality management in international rivers

By its nature, water is mobile, moving from one country to another, and taking with it pollutants. International law has recognised this issue by various conventions. An important Convention presently governing issues of the protection of international river basins is the UNECE 1992 - Helsinki Convention.

The UNECE Convention

The UNECE [3] Convention on the Protection of Transboundary Water Courses (including ground waters) and international lakes (Helsinki 1992) was opened for signature by 25 ECE countries. Up till now 13 countries and the European Community have deposited their relevant instruments of ratification with the United Nations Secretary-General. The basic obligation of this Convention is that the parties should take all appropriate measures to prevent, control and reduce any transboundary impacts (Article 1).

The Convention thus states that transboundary waters are to be "used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection". They should be used reasonably and equitably; conservation is to be ensured by and restoration of ecosystems should be promoted (Article 2).

There are three guiding principles:
a) **precautionary principle**: actions to prevent damage should not be postponed because of (still) insufficient research.
b) **polluter pays principle**: the polluter should in general bear the cost of pollution prevention, control and remediation.

[3] UNECE: United Nations Economic Commission for Europe, with 55 member States In Europe (and America and Asia)

c) Water resources should be managed to meet the needs of present generations without compromising on the ability of future generations to meet their own needs (**sustainable development).**

The Convention laws require that there must be licensing of wastewater discharges, and the limits of discharges should be based on **best available technologies** for hazardous substances. Municipal wastewater has to be biologically treated and best available technologies should be used to reduce nutrient discharges. Appropriate measures and **best environmental practices** [4] must be practised for the reduction of nutrients and hazardous substances from non-point sources.

Parties bordering the same transboundary waters have to conclude specific bilateral or multilateral agreements that provide for the establishment of joint bodies (*e.g.* river or lake commissions). They are also required to consult each other on any measures to be carried out under the Convention, jointly set water quality objectives, develop concerted action programmes and provide assistance to each other in critical situations.

Parties have to draw up standards to prevent transboundary pollution, and they have to set up monitoring systems, including "early warning" systems for *e.g.* accidental spills of hazardous chemicals. They also have to co-operate on research issues and exchange relevant information. Finally, the riparian States are obliged to modify and amend existing treaties that contradict the principles in the Law.

In case of a dispute, the Convention sets up a tribunal, which makes a binding award. However, no legal framework for enforcement is available.

Box 1: The Danube River Agreement

The Danube is the largest river in Europe, covering a catchment area of 817,000 km2 with a main river length of 2900 km. The river and its tributaries pass through 17 countries in total.

In 1994, a Convention was signed on Co-operation for the protection and sustainable use of the Danube River; this Convention falls within the framework of the Helsinki Convention. The Danubian countries, together with international financing organizations, G-24 countries and NGOs, decided to launch the Environmental Programme for the Danube River Basin. One of the first measures was to establish a Trans-National Monitoring Network.

Since 1992, various "Task Forces" have been established for the implementation of the Convention articles. An example is the **Task Force on Monitoring and Assessment,** which has produced a number of reports on *e.g.* guidelines for monitoring and assessment, quality control and an inventory of the current situation with respect water quality management, organization and monitoring in the Parties' countries as well as already existing international co-operation frameworks.

[4] Including items such as minimum environmental hazards, recycling, safe disposal, *etc.*

5 Environmental water requirements

The river environment include flora and fauna found in-stream, as well as the riverine area, including floodplains, wetlands etc.

The environment needs water for the following purposes:
- to live (physical habitat)
- to function (e.g. transpiration in trees)
- to move (e.g. migration)
- to feed
- to breed

The environment requires:
- flow of water (seasonality)
- depth of water
- velocity
- quality of water (levels of oxygen, pH, tolerable levels of pollution, sediment)
- temperature

It has now been generally accepted that the environment is a 'legitimate water user'. This is not merely a nice gesture to animal and plant-life, a luxury. It is also simply a survival strategy for us, human beings, and for our children. Because water is the basis of life.

Considering the environment a legitimate water user, however, poses a challenge: how much water must be reserved for the environment? The answer to this question must be very complex, as water for the environment should be specified spatially, temporally, and in terms of quality. Ecosystems thrive on fluctuations in discharge through the year: floods and low flows. Floods and low flows are, however, considered by many humans as problems. Therefore, many infrastructural measures have been taken to attenuate the hydrograph, without considering the environmental impact (as well as the economic and social impact on rural societies who live off recession agriculture and fisheries). As to quality, seemingly minute and insignificant changes in water characteristics, such as changes in temperature and silt load downstream of a man-made lake, may have large environmental consequences.

The man-made infrastructure makes it impossible to entirely restore a pristine environment. But given the rapidly growing environmental knowledge we should avert new projects which severely harm the environmental, while making the best of the existing infrastructure. The case of flood management is an example.

Artificial floods (Savenije and van der Zaag, 1998)

River development in the past was often equivalent to 'taming the floods' while harnessing the water for hydropower, navigation and irrigation. The outcome was nearly always the construction of dams and dikes. During the last 15 years, research findings point to a re-assessment of the 'taming the floods' paradigm, not only in Africa, but also in Asia (Bangladesh for instance) and Europe (Savenije 1996). In the river Rhine, for

instance, the complete control of the river course by dikes has resulted in higher flood levels along the lower reaches of the river. Land use change has had an impact on the rainfall-runoff relations, resulting in more rapid runoff, higher flood peaks and reduced low flows in summer. In the lower part of the river, the complete harnessing of the river cannot continue indefinitely, mainly because of sedimentation, land subsidence and sea level rise. In certain parts of the Rhine delta, the riparians will eventually have to get used to 'living with the floods' again rather than continuing to try to shut floods out completely. The hydrology of the Rhine thus forces us to fundamentally change our thinking. As much as we want to, humans are not the masters of the river. We are partners sharing the same space, and we cannot confine the river into an increasingly narrow straight-jacket. The recent floods in the Netherlands of 1993, 1995 and 1998 are slowly teaching us this lesson.

The reality of African rivers is not fundamentally different. Also here, the value of river floods is being re-assessed:

> The construction of large dams has been a major feature of water management in Africa over the past 50 years. .. The resulting reduction in flooding downstream was seen as a benefit and thus constructing a dam which was capable of making flood releases was never contemplated. More recently the great value of natural flooding to fisheries, recession agriculture and groundwater recharge has been realised. So much so that many authorities are now examining the possibility of creating artificial floods.
> (Scudder and Acreman 1996: 101)

The experiences of the Senegal basin (shared by Mali, Senegal and Mauritania), the Yobe (shared by Niger, Nigeria and Chad), the Kafue river (in the Zambezi basin shared by Angola, Zambia, Namibia, Botswana, Zimbabwe, Tanzania, Malawi and Mozambique), and the Phongolo river (in the Phongolo-Maputo basin shared by South Africa and Mozambique) show that it is environmentally beneficial, and economically feasible to simulate artificial floods by manipulating releases from existing dams. There is however an important technical prerequisite. Apart from the obvious fact that the design of dams should enable sufficiently large releases, artificial floods require that all operational decisions across the entire basin should be coordinated. Moreover, artificial floods require sophisticated real-time monitoring of hydrological and climatological phenomena (Hollis 1996: 184). This is because artificial flooding is only feasible if properly timed such that it 'surfs' on top of the limited natural flood streams that still occur.

New criteria and operational rules

The example of flood management shows that it is possible to minimise the damage to our environment, and better anticipate possible negative impacts of new infrastructural projects. What is required are certain *volumes of water* which are set aside, or 'reserved' for the environment; this is now done under the new water act of South Africa.

Bullock et al. (1998) estimated that the water requirements of the environment in the Mazowe catchment (Zimbabwe) may range between 5 to 15% of total generated runoff.

What is also required are *criteria* that will assist policy-makers in making balanced decisions in which the immediate economic interests are weighed against the interest of the environment. These criteria would generate practical operational rules, related to, for instance:

- reservoir releases which accommodate the environment
- water rights or permits, which contain conditionalities only allowing abstractions when a certain specified flow is let through
- water quality objectives and discharge permits
- dam designs to allow for artificial floods and fish passes.

Quantifying environmental water requirements

There are several assessment procedures for determining environmental flows. The decision on which procedure to use is dependent on the sensitivity of the aquatic environment, the complexity of the decision to be made and the increased cost and difficulty of collecting large amounts of information. Procedures for determining environmental flow requirements fall into one of four basic categories:

1. Historical discharge method: the Tennant method;
2. Hydraulic method: the wetted perimeter method
3. Holistic method: the building block method
4. Habitat rating method: Instream Flow Incremental Methodology

Each method differs in its data requirements, procedures for selecting flow requirements, ecological assumptions and effects on river hydraulics. The most commonly used methods for each of the categories are discussed below (HR Wallingford, 2001).

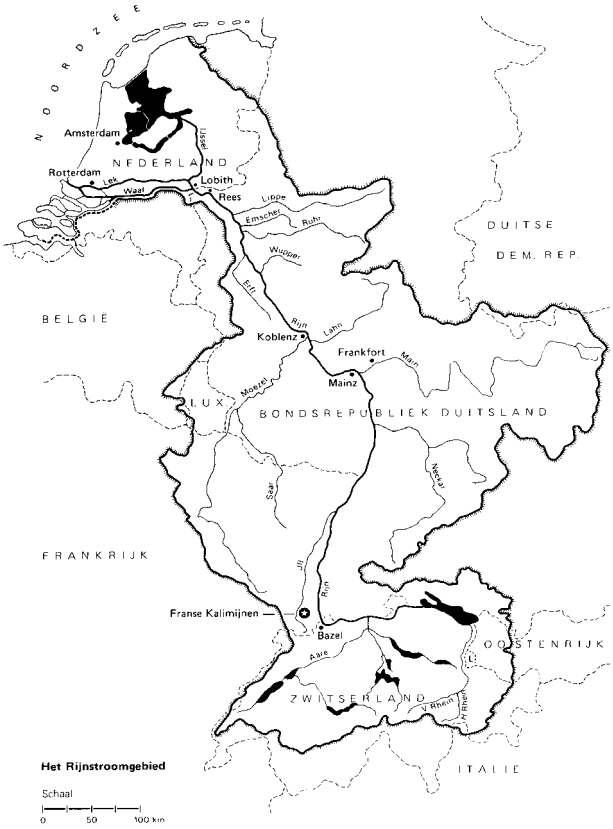
6 International aspects of water pollution: the case of the river Rhine (after Huisman *et al.* 2000)

The Rhine is an international river, with some 60 million people, and large industrial centres in its catchment area (Fig. 3). At the same time the Rhine water serves as a drinking water source for more than 20 million people. Since the 1960's the pollution problems in the Rhine have rapidly increased; they are characterized by:

- overall bad water quality, with low oxygen contents, high nutrient and micropollutants' levels;
- accidental spills by industries leading to calamities, such as the "Sandoz calamity";
- a sharp decrease of the fish population;
- poor drinking water quality;
- polluted sediments;
- pollution of the North Sea through the river Rhine outlet.

The case of the Rhine provides an illuminating example of how the riparian countries of this heavily polluted international river basin managed to address the water quality

problems. This involved a tedious negotiation process which started in the 19th century. More important than agreement over detailed emission standards is political resolve among the riparian states.



(Source: Breukel, R.M.A., 1993, De Rijn en Rijntakken; Verleden, heden en toekomst. RIZA, The Netherlands)

Figure 4: The river Rhine catchment area

The Rhine

The Rhine is a relatively small river with a basin of 170,000 km^2. The length of the river is 1,300 km, of which 880 km is navigable. The river basin lies in 7 countries: Switzerland, Austria, Germany, France, Luxembourg, Belgium and the Netherlands. The population in the basin is some 60 million. The average discharge of the Rhine is 2,200 m^3/s. The favourable hydrologic characteristics of the Rhine explain why it became an important traffic chain. At Basle, where the catchment area is only 25% of the total basin area, river discharge is nearly 50% of the total river flow when it reaches the North Sea. The flow distribution over the year is favourable too as a result of the snow storage in the Alps.

The salinity problem

The Rhine delta is very vulnerable for salinisation by the North Sea. In the course of the centuries measures increasing in scale became necessary to protect the Netherlands against salt water intrusion. In the densely populated western part of the country the ground water is brackish. In these regions water from the Rhine is used for the

production of drinking water. In the polders lying below sea level, there is a brackish seepage flow to the ditches and canals in the polders. To prevent salinisation of the soil the brackish water has to be removed and replaced by fresh water. The Rhine water was very useful for these purposes. Before 1900 the salt concentration in the Rhine didn't exceed 10 to 20 mg/l Cl^-. The rapid industrialisation and growth of population since 1850 heavily affected the self purification capacity of the Rhine and its tributaries. The increasing discharges of organic and inorganic substances became more and more problematic. The resulting increase in salt content of the Rhine water was a threat in the rear for the Netherlands. Having all but solved the problem of salt water intrusion from the North Sea, the Netherlands saw itself threatened by the same problem, this time from its European hinterland. In 1932 the Dutch government protested in Berlin and Paris against the increasing pollution of the Rhine. But in vain.

Post-war industrial pollution

After the Second World War the industrial activities in the Rhine basin again rapidly increased. In 1946 the Netherlands tried again to draw the attention of the other riparian states to the increasing pollution problem. In 1950, the Federal Republic of Germany, France, Luxembourg, the Netherlands and Switzerland created the International Commission for the Protection of the Rhine against Pollution (ICPR). At the end of the 1950s the Netherlands formulated quality criteria for the Rhine water. The international discussion of these criteria gave evidence of the contradicting positions of the upstream and downstream riparian states. The upstream riparian states recognised the pollution impact in the Netherlands. They also distrusted the Dutch appeal for a cleaner Rhine. The upstream countries thought that they were to pay the bill for the Rhine sanitation, while the Netherlands could continue to pollute the Rhine estuaries and the North Sea. Indeed, at that moment waste water from Rotterdam, The Hague and the large potato-flour industry in the north was discharged untreated.

The impact of the pollution came to a dramatic climax in the autumn of 1971. During the low water period the pollution with oxygen-consuming waste water and toxic substances reached such a high level that the Rhine lacked oxygen in its downstream sections. All aquatic life disappeared from these sections. The Rhine water had become unsuitable for any use. The bad conditions were observable.

The formal solution: conventions on emission standards

The all time low of the water quality in 1971 shocked the public opinion and governments in the Rhine states. In 1972 the Rhine states decided to take concrete, specific steps to reduce the pollution of the Rhine. Among others the ministers charged the ICPR to elaborate a convention to reduce chemical pollution. This convention was concluded in 1976. Due to mutual mistrust the convention contained detailed procedures. The convention provided a step by step elimination of the dangerous substances of the so-called "black-list" and a reduction of the substances of the "grey list". It prescribed the definition of *emission standards* according to the best technical means for the black-list and the best applicable means for the grey-list substances. The work proved to be more complicated and more time-consuming than expected. The best technical means of today are outdated tomorrow. Another complicating factor was the approval of the standards by the European Union, since 1976 member of the ICPR. Particularly the juridical approval of the Rhine decisions resulted in time-consuming negotiations in Brussels. As a result of these difficulties the ICPR only concluded

emission standards for 12 substances until 1986, ten years later.

The Sandoz disaster
On the first of November 1986, another disaster hit the Rhine: a warehouse at the Sandoz chemical industries near Basle set fire. Particularly the fire in the insecticide stores was disastrous, destroying 1,000 tons of agro-chemical substances. The fire was extinguished using about 10 to 15 million litres of water, a major part of which mixed with the chemicals and flowed into the Rhine. The next days showed a poison wave propagating downstream and killing all organisms. Tons of dead fish and other animals were taken out of the Rhine. Forty water works along the Rhine had to stop the intake of river water.

The Sandoz incident caused a wave of publicity and public concern in all riparian states. Already on the 12th of November the ministers met to discuss the situation. Now there was political resolve to prevent similar accidents in future. The ICPR was under high pressure to formulate transboundary actions. The result was the Rhine Action Programme (RAP) of 1987. Apart from measures to prevent accidents like the Sandoz incident, the ministers adopted new, clearly defined, long term objectives for the Rhine:

1. Higher species such as migratory fish should return to the Rhine by the year 2000. The salmon as the best known species is therefore used as a symbol.
2. Future use of Rhine water for public water supply using simple purification techniques must be guaranteed.
3. The pollution of sediments has to be reduced to such a low level that sediment can be applied on the land or dumped into the sea without negative consequences for the aquatic environment.

Political resolve: the Rhine Action Programme
The Rhine Action Programme provided a 50% reduction of the 47 most problematic substances between 1985 and 1995. An important means to achieve this goal is the regular up-dating of the best available technology. This is not enforced through the detailed procedure of the chemical convention, but simply in terms of political commitment. The modified approach implies that not only point sources but also diffuse sources, particularly originating from agricultural and traffic, can be tackled. Besides overall pollution reduction objectives, the Rhine Action Programme contains, for the first time in history, a commitment about the rehabilitation of the Rhine eco-system.

The resulting pollution reducing efforts in the Rhine states were substantial (Table 3). Between 1965 and 1989 the authorities in the five riparian states invested about US$ 60 billion in the construction and improvement of treatment plants. Sanitation of waste water from industries and municipalities reduced the concentrations of organic and inorganic substances.

The water authorities concluded in 1993 that for 38 substances the Rhine target values had been reached. For 9 substances the observed concentrations are still above the target values. The efforts to reduce these substances have been increased.

Riparian state should retain their sovereignty
The ICPR has to formulate the investigations about kind, source and extent of the Rhine pollution, recommend appropriate measures to reduce the pollution and to prepare

agreements between the participating countries. The actual implementation of measurements and measures is the responsibility of the individual basin states.

Table 3: Pollution reduction on the German-Dutch border in reference years

	natural load		1972	1985	1993	% change 1972-1993	% change natural-1993
mercury	0.7	t/y	99	5	2.5	-97	+257
cadmium	1	t/y	167	9	2.8	-98	+180
chromium	240	t/y	3627	378	251	-93	+528
lead	75	t/y	2000	441	346	-83	+361
copper	70	t/y	2018	473	314	-84	+349
nickel	n.a.	t/y	n.a.	356	219	n.a.	n.a.
zinc	250	t/y	13800	2995	1724	-88	+3348
TOC [a]	n.a.	kg/s	29	13	8	-72	n.a.
oxygen	10.0	mg/l	4.4	8.0	10.0	+127	0
phosphate	0.2	kg/s	1.3	1.0	0.5	-62	+150
nitrogen	0.3	kg/s	1.0	1.4	0.5	-50	+67

[a] Total organic carbon

The importance of common analytical standards and scientific evidence
After the creation of the International Commission for the Protection of the Rhine against Pollution (ICPR) in 1950, the ICPR started to investigate the kind and the extent of the pollution. An international measurement network was set up. Common analysis methods were developed. This proved a laborious exercise as measurement and analysis methods differed in the participating countries. This important activity provided the common basis for an objective assessment of the water quality. Later on this approach served as an example for many other international fora. Measuring methods to assess the water quality in transboundary waters, prepared and agreed upon in common understanding, create the basis for the formulation of joint measures. Sustainable transboundary cooperation needs a thorough, indisputable, scientific assessment of facts. Doubts about facts frustrate international cooperation.

Conclusion
The objective has always been: to arrive at Rhine water of sufficiently good quality to serve as a source for water supply, as well as serving as an environment of good ecological quality. As an “indicator species” the salmon was chosen.

Remaining problems still to be solved include the abatement of non-point sources (nutrients, heavy metals and pesticides levels and the (still too high) salt (NaCl) contents in the river water.

Over the last decades, lessons have been learnt during the international River Rhine co-operation, lessons that will be of use for future co-operations in the field of international river basin management (Huisman et al., 2001):
- Only voluntary decisions by riparian states create the basis for sustainable co-

operation on an international level. Wrested concessions do not last very long.

- Avoid unilateral promotion of individual and sectoral interests.
- Co-operation in transboundary river basins is a time-consuming process of small steps; mutual confidence is the only basis for successful co-operation.
- Promotion of all water related interests and information exchange with non-governmental organizations takes time, but supports the transboundary co-operation in river basins and enlarges the acceptance of proposed measures.
- Agreement over and adoption of measured standards and methods is an important basis for achieving the reduction of water pollution of shared water resources.
- Periodical updating of plans gives the opportunity to adapt objectives and measures to the changing conditions and opinions in society.

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B 1.4

Floods and droughts in international rivers

Code	B 1.4
Teaching topic	Floods and droughts in international rivers
Time (hrs)	1
Content/Skill focus	Introduction on floods and droughts in river basins
Objectives	To gain a basic understanding of the challenges associated with droughts and floods in shared river basins
Learning methodology	Conventional lecture; with reference to the Feb. 2000 floods in South Africa/ Mozambique/ Zimbabwe
Trainer/facilitator guide	- definitions - DPSIR (driving forces, pressures, state, impacts, responses) - structural and non-structural measures of drought and flood mitigation
Course book	K.J. Douben: "Floods and droughts in international rivers "
Course reader	
Further reading	Z.W. Kundzewicz, 2000, Coping with hydrological extremes. *Water International* **25**(1): 66-75 A. Carmo Vaz, 2000, Coping with floods – the experience of Mozambique. Paper presented at the 1st WARFSA/WaterNet Symposium "Sustainable Use of Water Resources", Maputo, 1-2 November 2000 Smithers, J.C., R. E. Schultze, A. Pike & G.P.W. Hewitt, 2001, A hydrological perspective of the February 2000 floods: a case study in the Sabie river catchment. *Water SA* **27**(3): 325-332

Floods and droughts in international rivers

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1. Introduction

The paper at hand is developed for the course on Conflict Prevention, Diplomacy and Co-operation in International Water Resources (for non-water managers) and Conflict Prevention and Co-operation in International River Basin Management (for water managers) in the framework of the PCCP-project (from Potential Conflict to Co-operation Potential). It gives a brief overview of problems, causes, possible approaches and concepts for prevention and mitigation of floods and droughts, using a specific framework. In general, problems and features of both floods and droughts can be analysed using the DPSIR (Driving forces, Pressures, State, Impacts and Response) assessment framework [EEA, 2001]. This framework is illustrated in Figure 1.1.

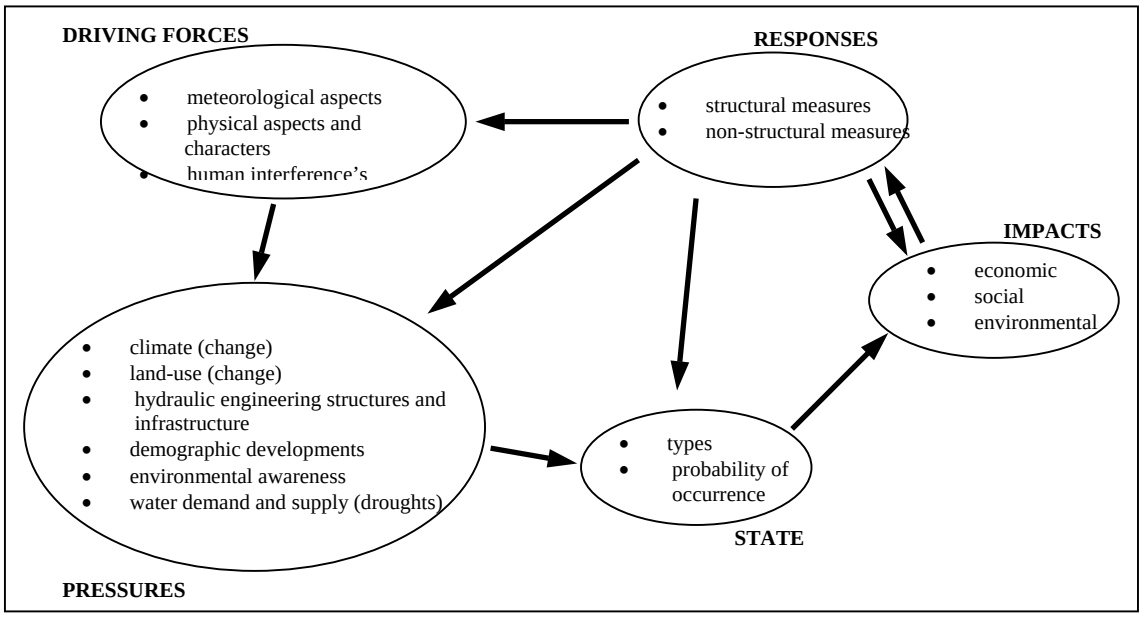

Figure 1.1 DPSIR-framework for floods and droughts *[EEA, 2001]*.

The *driving forces* are defined as natural phenomena and characteristics, which (partly) cause the appearance of certain events like floods and droughts. *Pressures* are mostly man-made changes and adjustments in (parts of) a catchment area, which induce and/or intensify impacts of floods and droughts. The causes of floods and droughts in general are based on a combination of both driving forces and pressures. The type and the probability of occurrence of floods and drought determine the *state*. *Impacts* can be

defined as the socio-economic and environmental effects, commonly expressed as damages caused by driving forces and pressures. Finally, the *responses* are based on different (structural and non-structural) measures to cope with floods and droughts and their impacts.

Definition of flood
Seasonal fluctuations in water levels and discharges as well as the flooding of riparian areas are natural features of running waters. Extreme weather events, resulting in large volumes of water flows, can however, cause enormous damage to lives and property, especially where floodplains are occupied and flooding interferes with human land-use activities. Floods can be generally described as situations of extreme water run-off during which human lives, property and infrastructure are threatened [EEA, 2001].

Definition of drought
Although drought is a phenomenon, which is apparently easy to recognise, there is no general agreement among experts regarding its definition. Droughts are normally described in terms of precipitation or run-off during a certain period of time and might in general be defined as a serious water shortage. This implies some specification of the amount of water required and the purpose, for which it is to be used, both of which will determine whether a drought condition exists. In general terms, a drought can be described as a 'decrease in water availability in a particular period over a particular area' [Beran and Rodier, 1985].
What constitutes a drought for a given use in a given location may not be considered a drought elsewhere. For example, in Bali (Indonesia) a drought is defined as a period of six days without rain, whereas in Central Australia an annual rainfall total of less than 200 mm might be considered normal and a severe drought may have a duration of several years [EEA, 2001 & ESCAP, 1997].

Although floods and droughts can be considered as two different weather related events, they can occur shortly after each other, or even simultaneously, in a certain watershed or catchment area. This is why several prevention and mitigation measures should be approached integrally. This integrated approach is an important issue in this paper.

2. Driving forces

Droughts
The driving forces for droughts consist mainly of *meteorological* and *human/physical* features. The meteorological driving forces can be divided in:
- Atmospheric circulation patterns;
- Rainfall deficiency and;
- Temperature.

Atmospheric circulation patterns
The atmospheric circulation pattern, particularly the location and persistence of high-pressure centres, has a major influence on rainfall and temperature. High-pressure systems are generally characterised by low precipitation.

Rainfall deficiency
Rainfall deficiency is the primary driving factor for drought and directly influences soil moisture, groundwater recharge and river flow, although the hydrological system will often delay the effects. Rainfall is the most widely used indicator of drought conditions. Rainfall deficit is expressed as rainfall over a selected period (a month, season or a natural or hydrological year) compared with the long-term means over a standard period. A problem with this simple index is the choice of the threshold below which the deficit must fall to identify the onset of the drought, but 75% is commonly adopted. The severity of a drought is not simply a function of the size of the rainfall deficit but depends on the timing of the deficit. Rainfall deficiencies can have different hydrological impacts depending on the preceding levels of storage. Droughts in, for example the growing season can have serious implications for agriculture. The duration of the deficit highly affects the severity of a drought and its impact.

Temperature
Temperature is an important driving force on drought throughout the year. Winter droughts are caused by air temperature continuously below 0ºC. During this period, precipitation is stored in the catchment in the form of snow and ice, where it is unavailable to recharge rivers and aquifers until temperatures are raised and melting begins. These droughts receive less attention than summer droughts, but occur frequently in mountainous areas.
Summer droughts are normally associated with clear skies, sunshine and high temperatures, which increases evapotranspiration to the extent that little or no rainfall is available for recharge. So, winter droughts are most prevalent in mountainous areas, mixed droughts in upland basins, while lowland areas have most severe droughts in summer [Kašpárek and Novický, 1997]. This clearly reflects temperature differences associated with altitude.

Some (hydrological) droughts are not caused by natural phenomena, but are entirely man-made through over-abstraction or mismanagement of available resources. These kind of droughts are mainly enforced by human and physical driving forces, such as:
- Natural catchment storage and;
- Socio-economic factors controlling the demand for water.

Natural catchment storage
Water naturally stored in a catchment (as soil moisture, in lakes, rivers, aquifers and wetlands) helps to determine the impact of any rainfall deficit. In times of sustained rainfall deficit (and no snowmelt), stream flow decreases until it consists entirely of groundwater flow (base-flow), which strongly depends on the hydro-geology of the catchment. Catchments with significant artificial storage in reservoirs, groundwater recharge or regulated flows can withstand the impact of a drought for a longer period than an entirely natural catchment. Hence, preceding storage conditions are an important driving factor for droughts. Even with sufficient long-term water resources, the seasonal or inter-annual variation in the availability of water can sometimes induce problems of water stress. For water resource planners, decisions on water use are frequently based on the resource they can expect in periods of dry weather or low river flow. A valuable indicator of this is the 90^{th} percentile flow (Q90), representing the freshwater resource, which can be relied upon for an average of 328 days a year (i.e.

90% of the time). Q90 may be used operationally to determine limits on the rates of abstraction from a river or to set levels for minimum (ecological) flow.

Socio-economic factors controlling the demand for water
The most severe hydrological droughts do not always occur in areas with the lowest effective rainfall, but are partly driven by the demand for water. Local demand often exceeds local availability. Problems of stress and overexploitation occur mostly in areas of high population density and in regions where agricultural production depends on irrigation. Changes in population, population distribution, density and general standards of living are key factors that influence the demand for water resources. Agriculture, and particularly spray irrigation, is often the most water-demanding sector. In general, the main water use(r)s are:

i. Public water supply;
ii. Industry;
iii. Agriculture and;
iv. Cooling water.

Often, this demand is fulfilled by surface water abstractions. Until recently, resources have in general been developed to keep pace with the increasing demand. Nowadays the focus is on more efficient use of existing resources to improve and protect the water environment and resources (see also 6. Responses).

Floods
The driving forces for floods are also related to meteorological (precipitation) and physical (catchment characteristics) features.

Precipitation
River flooding can be caused by continuous precipitation over several days, or by a very intense rainfall in a very short time in the catchment area. In the former case, rainfall reaches the stream by direct inflow, by soil, subsurface or groundwater infiltration (large river basins). In the latter case, precipitation runs-off with a very short delay directly after the rainfall (small (mountainous) watershed areas and/or tributaries).

If short but intense rainfall occurs, the infiltration capacity of the soil may not be effective because of the short duration of the event. Water that has not been absorbed by the soil becomes surface run-off, leading to a quick rise in the water level in rivers and an increased danger of flooding. This risk can be enhanced by snowmelt or frozen soils (permafrost) [Douben, 2002].

Catchment characteristics
Along with the temporal and spatial distribution of precipitation, the effects of vegetation, soil, ground surface retention and drainage network in the catchment are of vital importance in determining the response in water flow and flood generation:

- Vegetation and soils. Vegetation intercepts and stores water when precipitation starts. The soil stores water, up to 100 times the quantity held by vegetation. During a flood, the available water absorption capacity of the soil is limited by the amount of water already stored. The soil behaves like a sponge, at first it can absorb a lot of water, but if precipitation continues, it absorbs less and less.

Forests often play a vital protective role with regard to water erosion in regions with fragile soils.

- Ground surface retention and drainage network. Steep land (in mountainous areas) offers little surface retention and allows run-off to converge quickly. By contrast, more water is stored in flat areas. Vegetation and certain types of land management aid surface retention. Dense vegetation, land divided into small parcels and sustainable land-use along slopes increase the surface retention.
  Water storage within the drainage network is greatest on levelled land and in extensive flood meadows (i.e. floodplains and detention areas). It influences the timing of floods and, thus, the time at which the water in the main river and its tributaries converge.

- Floodplains and low-lying areas. When discharges exceed the conveyance capacity of the main river channel, waters overflow into the floodplains. Floodplain storage and retention reduces the peak discharge and influences the temporal evolution of the flood, mainly by increasing its duration.
  In low-lying coastal areas, when peak flows are combined with high tides, floodwater cannot be fully discharged to the sea, causing a back-up of water behind the sluices and an increased risk of flooding.

3. Pressures

General

From the different pressures that induce and/or intensify impacts of floods and droughts, climate change and land-use have a common (adverse) effect.

Climate change

There is mounting evidence that the global climate is changing as a result of human activities. Global warming may as a result of altering precipitation patterns, changing precipitation intensities, duration and distribution increase the recurrence frequency of drought-producing weather conditions in some regions on the one hand and increase extreme rainfall events with a higher frequency of heavy precipitation on the other hand [McCarthy et al., 2001].

Another important effect of climate change is the impact of increasing temperatures on the vegetation structure. A change of the vegetation structure in a catchment can affect soil properties and retention capacity and, as a consequence, the run-off.

Land-use (vegetation cover, land sealing and urbanisation)

The type of land cover directly influences the storage conditions and hydrological response of a catchment and thus its vulnerability to drought and flood generation. Land-use changes such as afforestation (droughts), deforestation (floods), clearance, urbanisation (drainage and sealing) and agricultural intensification may therefore alter this hydrological response.

Although the impact of land-use and run-off on low flows and drought is less, it determines how much rainfall is lost through evapotranspitation and the balance

between surface run-off and infiltration. The rate of evapotranspiration depends on climate, type of crop, density of planting, physiology and the extent of water available for irrigation.

Afforestation and urbanisation of agricultural land have significant effects on the local hydrology. It is generally accepted that afforestation of a catchment reduces mean run-off, which is beneficial in reducing floods, through increased interception and evapotranspiration. This leads to drier soils, reduced recharge and greater vulnerability to drought than if the land-use was grass or short crop. On the other hand this vegetation cover has an important effect on the attenuation of small and medium-sized floods. For a large flood, however, its effect is not so important, though it is extremely beneficial to reduce basin erosion and, consequently, on the amount of solids discharged. The precise impact on the stream hydrograph depends on the different stages of forest growth, the type of tree, density of planting, different climatic zones, soil types and general land management practices. Still, when a region is both prone to floods and droughts, land-use management is a very important mitigation measure, which has to be applied in a delicate and balanced manner.

Human activities have traditionally been located on flat and fertile alluvial areas close to rivers. An increase in population over recent decades has placed a greater demand on natural resources and space. In past centuries, floods were also catastrophic but their economic and social impact was smaller than today.

Urbanisation is often cited as one of the major human modifications to catchment hydrology in developed areas [UNESCO, 1979]. It has (mainly negative) impacts on the hydrological cycle.

In general, urbanisation increases the frequency of peak flow discharges and reduces the time of rising discharges because of land and soil sealing and increased surface run-off. Urbanisation also leads to reduced infiltration and reduced base-flows locally. In some regions, semi-arid climates coupled with poor land and crop management can lead to desertification. Finally, soil erosion reduces the capacity for infiltration, hence increasing the vulnerability of regions to both droughts and floos.

Artificial land sealing, which increases the risk of flooding at the regional level as a result of direct run-off, can result from the expansion of settlements and traffic networks. Also, agricultural activities can induce modifications in river basins. Water-retention areas on floodplains are sometimes removed in order to gain arable land. Problems of soil compaction and soil erosion can occur if heavy machinery is used in agriculture and forestry.

Droughts

In the aftermath of a major drought event, it is common to question whether droughts are becoming more frequent or more severe. Besides climate change and land-use, several other pressures influence the hydrological regime and alter the vulnerability of an area to drought. Although it is difficult to prove statistically, there is some evidence that these pressures may be increasing the impact and frequency of droughts.

Water demand and water resource availability
In many countries public water supply demand rises as a result of population growth and increased consumption as a result of increased standards of living with increased use of water-using appliances. Assessments of (future) water demands result in different, geographically defined, trends. In Europe for instance, a clear stabilisation of demand reveals, while in many developing countries demands are increasing.

The seasonal water demand variability as well as the local variability in a country makes some areas particularly vulnerable to the effects of a drought, because of water resource unavailability at local level. On the other hand, droughts can affect areas where the annual demands are well supplied with current water resource schemes, but temporal pressures can unbalance the equilibrium between demand and supply in case of dry periods. Droughts can also occur geographically when the distribution of water resources does not coincide with the population distribution.

Sometimes the hydrological impacts of a meteorological drought are exacerbated by overexploitation of resources. This happens particularly with groundwater resources, leading to a lowering of the groundwater table, drying up of springs and upper river reaches, reduction in river flows, destruction of wetlands and salt intrusion (coastal areas).

Environmental awareness
Recent droughts all over the world have increased public awareness of the fragility of water resources in many areas and of the environmental as well as the supply consequence of a drought. Maintenance of river ecology is now viewed as an acceptable use for water and many abstraction licences are only granted with restrictions to protect this use at times of drought. This and other measures, such as the release of compensation water from reservoirs, will reduce the pressure on river flows and maintain base-flows for longer periods.

Floods
Precipitation is the main driving force inducing floods, but some pressures related to human activities, besides climate change and land-use, intensify the adverse effects of floods.

Roads and railways
Road and rail networks are often situated in river valleys. Their construction leads to an increased run-off via canalisation. In addition, the sealing of land reduces the water-retention capacity of a catchment. Hence, the construction of road and rail networks can intensify floods and their catastrophic effects. Linear infrastructure with insufficient drainage works may divert flows to other (not protected) areas or increase water levels upstream.

Hydraulic engineering measures
In some cases, hydraulic engineering works, which have to mitigate the effects of floods in one area, can worsen their effects in another. River channelisation works can speed up the flood wave propagation and increase flood risks downstream. Channelisation generally changes a heterogeneous meandering river into a homogeneous straight channel with an increased bed slope, uniform flow conditions and less habitat diversity

compared to the undisturbed situation. Bed and bank erosion, loss of riparian trees and damage to riverbank structures are frequently cited changes. Increased erosion and sedimentation reduce the conveyance capacity of stream channels, hence flooding occurs where rivers previously would have remained within their banks.

Flood reservoirs constitute a very efficient method of protection against floods. However, they can aggravate the effects of a flood if, for example, the spillway is insufficient or incorrect reservoir operations are carried out.

Furthermore, it must be borne in mind that river channelisation and reservoir construction may eliminate small or medium-sized flood events but cannot always hold back large floods. Also, attention must be paid to the construction of hydraulic works in dry rivers and the consequent occupation of floodplains, partly because of the false feeling of safety that the new protection works bring to people.

River regulation works separate the rivers from their floodplains, while under natural conditions they closely interact with each other. With regard to flood events, undisturbed floodplains increase the water-retention capacity during flood periods. In many developed countries, the natural balance between rivers and their floodplains has been disturbed [Douben, 2002].

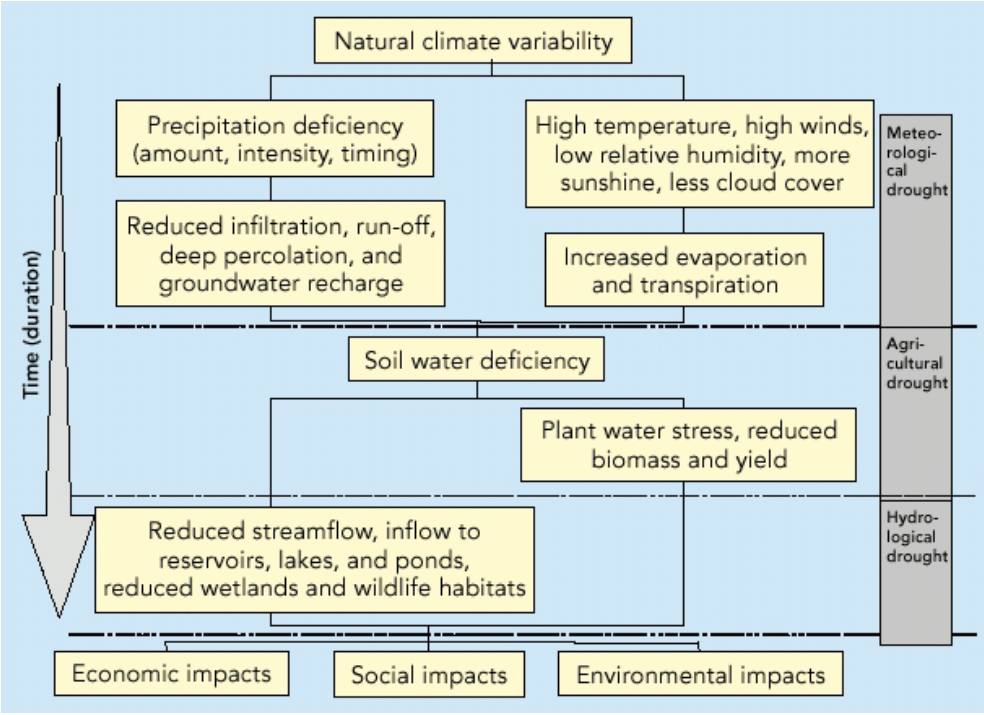

Figure 4.1 Gradation of drought severity and persistence [EEA, 2001].

4. State

Droughts

The different types of drought grade into each other spatially as well as temporally as shown in Figure 4.1, and can be divided in:

- *Meteorological*, which can be defined as a significant decrease in the normally expected seasonal rainfall, extending over a substantial area. It is often defined by the number of days with less rainfall than some predetermined threshold. The parameters used to measure and express its effects are the total rainfall depth and the duration of the drought period.
- *Agricultural*, which can be defined as a period during which the amount of rainfall and soil moisture content are inadequate for crop and pasture growth and animal production. The parameters used to express its severity are rainfall depth and soil moisture content.
- *Hydrological*, which can be defined as a period of below average water content in rivers, reservoirs, lakes, groundwater aquifers and soils. The parameters used to indicate its magnitude are given in terms of water storage volumes and available flow rates.
- *Water resources*, which can be defined as an insufficient amount of water to maintain supply. It can result entirely from a deficiency of rainfall, from poor resource management or from a combination of the two.

Hydrological droughts are usually out of phase with the occurrence of meteorological and agricultural droughts. Sometimes, one type of drought can occur without the other types.

The probability of occurrence of droughts is normally based on historical precipitation data. After defining the specific drought type and the concomitant threshold, a statistical analysis is used to calculate the drought probability.

Floods

In general, a distiction can be nade between for different types of ‘river basin floods’ [Douben, 2002]:

- River flood;
- Flash flood;
- Stagnant and urban floods and;
- Lake floods.

River flood

In large river basins, flooding is usually frontal and seasonal. Hydrographs are normally broad-based and peak discharges may last a number of days. The majority of floods recorded around the world are the result of river floods. Floods, at a given location in a river system, are a function of the hydrological processes in the catchment upstream of that location. The relationship between the flood behaviour in headwater catchments and the flood behaviour of the entire river basin is often complex and is not always perfectly understood. The downstream characteristics of the flood differ from the upstream characteristics because of lag, routing effects, scale effects and changes in geology, physiography and climate.

Severe overland floods in central and lowland parts of river basins are characterised by flooding of extensive areas, a relative slow response to the cause of the flood and relative long duration. As rising water levels are relatively slow and response times are long, there are more chances for real-time forecasting and mitigation measures such as evacuation and flood protection. Nonetheless, their impact and the economic damage caused may be substantial because of the size of the flooded area.

River related flooding also brings indirect threats arising from food and drinking water shortages and the spreading of diseases, caused by a prolonged lack of properly functioning infrastructure in the flood prone regions.

Flash flood
Flash floods usually develop from local precipitation of an extremely high intensity, as generated during (slow-moving) thunderstorms, thus leading to flooding in a limited area with a high rate of flow and catastrophic amounts of damage. In addition to this there are seasonal flash floods that occur, for example, in winter or spring when precipitation and snow melt coincide. When heavy rain pours on soil that is already saturated or frozen, in other words 'sealed naturally', the water can only run-off on the surface.

As a result of their local character, flash floods appear sudden and unforeseen. Effective protection measures are not always possible.

Flash floods tear away everything that is not securely fixed. Driftwood and other bulky-objects become wedged at bridges and at narrow passages so that the rivers get clogged up, which may lead to widespread flooding.

Flash floods are often several hundred times the normal average flow in a watercourse and can occur almost anywhere but are particularly dangerous on steep slopes. Flash floods are also a common phenomenon in arid zones because parched ground (like saturated ground) normally has a low absorbing capacity.

Flash floods are also aggravated by anthropogenic influences like the training of small water courses (straightening, reducing the roughness of the bed), new methods of farming, the sealing of municipal areas and the resulting increase in the amount of rain and snow that is channelled into the water system. Other causes of flash floods are a dam or levee failure, or a sudden release of water held by an ice jam.

Stagnant and urban floods (impeded drainage)
Extreme local rainfall combined with impeded and/or blocked drainage may cause inundations. This type of flooding, depending on topographical and soil conditions and the existence of adequate drainage facilities, mainly occurs in flat and lower-lying regions (e.g. polders) of a basin and urban areas. During periods of urban flooding, streets can become swift moving rivers, while basements can become death traps as they fill with water. A relatively thin sheet of flooding (a few cm to a half a metre deep) occurs in some places where slopes are not steep enough to cause rapid run-off.

Lake floods
Exceptional periods of precipitation or long lasting inflows from streams and rivers can cause a substantial rise in the water level of lakes, which lack sufficient drainage or have inadequate outlets. The often densely populated shore areas then inundate for several metres.

Longer-term or even permanent flooding of lake areas may occur if sediment fills the lake to the point that the capacity to store in-flowing water is minimised. Short-duration flooding along lake shores is usually caused by wind-driven waves. In addition to flooding an area, waves have great erosive powers and a battering effect on structures.

Probability of occurrence of floods
The analysis of the probability of the occurrence of a flood is traditionally based on the concepts of return periods and the frequency law of maximum flow discharges. The return period associated with a defined flow is equal to the number of years between floods that exceed that flow. It is important to highlight that given the stochastic nature of floods, this number of years is only an average value.

The maximum discharge frequency law is formed by discharges corresponding to different return periods. Maximum discharge frequency laws corresponding to large basins and moderate hydrological regimes have usually a small growth rate (e.g. Figure 4.2).

Figure 4.2 Maximum flow discharges in two Spanish rivers [EEA, 2001].

5. Impacts

Droughts

The low flow regime of a river controls a wide range of natural and water resource issues. Low flows are critical to maintain surface water abstractions for industrial, domestic and agricultural water supply as well as for dilution of effluents, navigation, hydropower production and recreation. Low flows must also provide sufficient freshwater habitats for a wide range of flora and fauna. During a drought the low flow regime will be placed under even greater pressure with competition for water between different users. This will often result in restrictions or curtailing (a water resources drought) of abstractions with attendant social and economic consequences and a deterioration, often severe and long-term, in the river ecology (an ecological drought).

The above shows that drought can produce a complex web of impacts that spans many sectors of the society and reaches well beyond the area experiencing a physical drought [NDMC, 2001].

Impacts of drought are commonly referred to as direct (short term) or indirect (long term) [NDMC, 2001 & ESCAP, 1997]. Reduced crop and forest productivity, increased fire hazard, reduced water levels, increased livestock and wildlife mortality rates and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect impacts. For example, a reduction in crop and forest productivity may result in reduced income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced tax revenues because of reduced expenditures, increased crime, foreclosures on bank loans to farmers and businesses, migration and disaster relief programs. Direct or primary impacts are usually biophysical. Conceptually speaking, the more removed the impact from the cause, the more complex the link to the cause.

In general, the impacts of drought can be listed as economic, environmental or social.

Economic impacts

Many economic impacts occur in agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease and wind erosion. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect. Retailers and others who provide goods and services to farmer's face reduced business. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls and loss of tax revenue. Prices for food, energy and other products increase as supplies are reduced.

Reduced water supply impairs the navigability of rivers and results in increased transportation costs because rail or trucks must transport products. Hydropower production may also be significantly curtailed.

Environmental impacts
Environmental losses are the result of damages to plant and animal species, wildlife habitat, air and water quality, forest fires, degradation of landscape quality, loss of biodiversity and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Social impacts
Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life and inequities in the distribution of impacts and disaster relief. Many of the impacts specified as economic and environmental have social components as well. Migration is a significant problem in many countries, creating refugee problems. Migration is usually to urban areas within the stressed area or to regions outside the drought area. However, when the drought has abated, these persons seldom return home, depriving rural areas of valuable human resources necessary for economic development. For the urban area to which they have immigrated, they place ever-increasing pressure on the social infrastructure, possibly leading to greater poverty and social unrest. The drought-prone Northeast region of Brazil had a net loss of nearly 5.5 million people between 1950 and 1980. Although not this entire population shift was directly attributable to drought, it was a primary factor for many in the decision to relocate. This continues to be a significant problem in Brazil and many other drought-prone countries.

Drought represents one of the most important natural triggers for malnutrition and famine, a significant and widespread problem in many parts of Africa and in other countries as well. Deaths resulting from famine are sometimes mistakenly attributed to drought rather than to underlying causes such as war or civil strife. Numerous early warning systems have been established in Africa to monitor a wide range of physical and social variables that signal a trend toward food insecurity. The Southern Africa Development Community (SADC), for example, monitors the crop and food situation in the region and issues alerts during periods of impending crisis.

Floods
On average, the higher the water depth and the greater the flow velocity of a flood, the greater the damage. In addition, the high speed of onset and/or long flood duration exacerbates flood-related phenomena.

Losses occurring during and immediately after the flood event, including loss of human life and damage to property, are called direct losses.

Indirect losses, such as increased vulnerability of survivors, disruption of traffic and trade, reduced public confidence in the area and environmental consequences of flooding, are often equally or even more important, but they are more difficult to assess than the direct losses.

Factors associated with flood damage are different and strongly depend on land-use. Flood duration, for instance, is an important factor in agricultural damage, but it is much less important for other land-uses. The suspension of activities, as well as the interruption of electrical services or communications, can affect urban areas.

Flood risk can be analysed as two independent components, one based on the *hydrologic and hydraulic regime*, and the other based on the *land-use and the socio-economic perception of risk*.

The first factor is called *hazard* and depends only on the flow regime of the river (mainly maximum water levels, discharges and flood duration), independently of the land-use on the floodplains and inundated areas.

The second factor is called *vulnerability* and it represents the sensitivity of land-use to the flood. Consequently, it depends only on land-use and the social perception of risk. For instance, it can be assumed that the same campsite has the same vulnerability wherever it is located, on a floodplain or on the top of the hill. The difference in the risk level is due to the occurrence of flooding, which is obviously different in the two situations.

Water quality problems, associated with a flood, has also impacts on natural ecosystems and human life. For example, almost all floods in urban areas will be contaminated with sewage, potentially affecting the health of people in the area.

On the contrary, floods sometimes provide benefits in a natural system and some ecosystems depend strongly on them. Moreover, some people rely on floods for irrigation and fertilisation [Douben, 2002]. In many developing countries it is said “people do not die because of floods, but people die if there are no floods. Absence of floods reduces crops and soil turns into a desert”. On the long term, the benefits of natural floods almost certainly outweigh the negative aspects.

Basically, the benefits of floods include the following:

- Soil fertilisation of floodplains;
- Floods provide much of the critical habitat for many biotas such as fish, wildlife and the waterfowl;
- Floods carry food to ocean estuaries, which are breeding grounds for marine life;
- Improvement of livelihood and health services of communities after a flood event as a result of the development of sustainable flood management policies and practices;
- Deposition of sediment keeps the elevation of deltas and estuaries above sea level and;
- Percolating floodwater in floodplains is important to recharge groundwater reserves.

6. Responses

Droughts

Inadequate rainfall can cause drought, as well as increasing demands on water supply. Lack of rain is a physical event that cannot really be changed. Habits and expectations (demands) regarding water use are the social side of drought. To reduce vulnerability to drought, the balancing of water supply and demand should be improved:

- *Supply*. Fresh water originates from precipitation and groundwater. In some cases, groundwater is replenished quickly after rains. In other cases, groundwater is 'fossil water', absorbed very gradually into veins of porous rock.
- *Increasing supply*. The best way to improve water supply is to pay attention to what happens to rain after it falls. People can make the most benefit of rain through water harvesting; capturing it and using it as close as possible to where it falls.
- *Demand*. Principle demands on water supply are for drinking and bathing, irrigation, hydroelectric power, transportation, wildlife habitat, etc.
- *Decreasing demand*. The demand for water can be reduced by implementing land-use and agricultural policies to encourage water conservation and by installing a conservation ethic in residential, commercial and industrial water users.

Drought prevention relies on both technical (predominantly structural) and economic (predominantly non-structural) measures. It also entails the adaptation of technologies and management policies, capable of making an appreciable impact on the economic system in which water resources are located. In addition to technical and economic measures, the participation of the people affected is of fundamental importance, particularly to reduce water consumption.

Structural measures for drought mitigation

- *Supply strategies (increase of system flexibility)*. The use of *storage reservoirs* helps to overcome the uneven distribution of natural water resources over time. Run-off in the wet season can be held back and used in the dry season (seasonal regulation), while water available in the wet years can be stored and used in dry years (inter-annual regulation).

- *Inter-basin transfers*. The construction of inter-basin transfers can be an efficient and cost-effective means to satisfy water demand in specific regions during drought periods.

- *Demand management*. Structural measures to improve water-use efficiency deal with the improvement of existing infrastructure such as concrete lining of canals, implementation of localised irrigation, levelling of fields, improved drainage, reducing leakage, use of more water-efficient appliances, metering of (domestic) supply and recycling. In many countries water saving irrigation techniques, such as drip-irrigation is promoted. Also the efficiency of irrigation systems has to be improved, leakage's reduced and more drought-resistant crops have to be cultivated.

- *Water harvesting*. Collecting 'all the available droplets of meteoric water' is a very common goal in some arid and semi-arid countries and benefits from enhanced

techniques. 'Water harvesting' has become synonymous with enhancing the possibility to capture the largest quantity of rainwater in dry lands during the short rainy season. This kind of experience is common in many parts of the world (e.g. setting up small ponds for irrigation with a storage capacity of a few thousand m^3).

- *Supply strategies (non-conventional sources):*
  - ◊ Applying *artificial precipitation* is now in study by seeding the clouds with suitable chemicals. It can increase the annual average precipitation, but feasibility is low regarding cost-benefits.
  - ◊ The practise of *wastewater reuse* is increasing all over the world, to alleviate the lack of water resources in certain regions or in certain drought periods. The largest application of reuse is the irrigation of crops and green areas.
  - ◊ Seawater desalinisation is being applied mainly in areas where no other sources of supply are available at competitive costs. The potential of seawater desalinisation as a viable future option depends on advances in technology, evolution of the energy costs and the costs of alternative sources. Until now, experiments conducted with different crops and water having different salt concentrations have given encouraging results.

Non-structural measures for drought mitigation

- *Early warning systems (drought alert indicators).* In most cases, droughts are identified too late for emergency measures to be effective. Clear and consistent criteria for drought identification ought to be established which, in a crisis situation, would allow adequate responses in water resources management. A wide variety of methods have been developed to define and monitor drought events. The threshold (or truncation) method is now being used increasingly to express a drought in terms of its duration and severity [Institute of Hydrology, 1999]. Other methods include calculating a cumulative precipitation deficit for the drought period or the use of physically based models [ICID, 1998].
  Often low-flow bulletins are issued when the river flow drops below a specific level, which contain information on water intake values, water levels, etc. at key locations. This information is relevant for water managers to decide on intakes or flushing operations (agriculture, natural conservation, operation of structures for navigation and salinity control, etc.).

- *Emergency plans*. Anticipation of drought by using forecasting can result in various actions that may help in the alleviation of drought consequences. When an early warning system identifies a drought, the actions to be triggered can be classified into two main groups: (i) demand oriented and (ii) supply oriented. Careful planning of these actions is probably the only effective way of combating the effects of a drought.

- *Changing cultivation patterns*. In agriculture, switching from irrigated to dry crops could be an interesting issue, in particular in regions where reforestation of large areas is considered for the benefit of flood mitigation. To change the cultivation pattern takes a long time, as it entails the transformation of entire economic sectors and has to cope with deep-rooted traditions of the populations concerned.

- *Demand management*. The concept of 'water demand management' refers to all those activities that aim to render the greatest possible amount of services using the least possible volume of water:
  - ◊ The *command and control approach*, based on a *licensing system*, has traditionally been applied to try to achieve the required balance between the different demands. However, economic instruments (*pricing mechanisms*) are being applied increasingly to complement the licensing system as water resources of adequate quality become scarcer and water therefore becomes an important economic good.
  - ◊ During drought a wider range of policy instruments, including the application of *special environmental changes and taxes*, is often used.
  - ◊ *Improvement programmes,* applied in industry are principally similar to the ones applicable in urban water supply. Their aim is to promote water substitution, reutilization and recycling.
  - ◊ Potential measures to improve water-use efficiency can be divided in to those that aim to improve the *performance of water distribution* entities (public bodies and user associations) and those, which aim to improve *water-use efficiency*. The non-structural aspects to improve water-use efficiency consist of improvement of organisation and management, improvement of knowledge about water losses, establishment of information systems, improvement in determination of crop demand and adjustment of water allocations, optimisation of timing and tariff systems.
  - ◊ In order to make the public more sensitive to drought and water conservation and the methods to mitigate impacts, *educational or information campaigns* must be adopted.
  - ◊ *Supply strategies (additional sources of supply):* During droughts, aquifers play a vital role in meeting water demand. Aquifers can be an efficient natural solution to water scarcity, being able to overcome a wide range of situations: supplying water under a variety of conditions, controlling abundant reserves and covering extensive areas, as well as transporting and distributing water. However, the use of aquifers in semi-arid areas or in drought periods depends on annual recharge and requires effective management if sustainability is to be achieved. Intensive groundwater exploitation can give rise to overexploitation, depending on the balance between abstraction and renewable resources. In general, the absence of abundant rainfall and run-off increasingly encourages the use of groundwater resources, frequently leading to excessive abstraction for irrigation and overexploitation.

    The joint use of surface and groundwater presents opportunities to make use of the natural buffer capacity of aquifers in dry periods and to ensure recharge when water is abundantly available.

- *Land-use planning and management.* Land-use planning and management can provide a range of tools and techniques to assist in the mitigation of drought disaster. These include a wide range of special agricultural practices aimed both at improving preparedness for drought and managing drought conditions more effectively. Conservation farming practices are designed to increase the intake and storage of soil moisture, to reduce the rate of usage for soil moisture and to mitigate the in-drought and post-drought effects of wind and water erosion. The conservation and storage of food, fodder and water and a variety of livestock management

techniques are also employed both as drought survival tools and as safeguards against drought-induced land degradation.

Floods

Measures taken in response to flooding are usually aimed to reduce the flood damage, in which some general aspects have to be taken into account:

- *Co-ordination.* There is a clear need for joint and co-ordinated actions between the different local, regional and state administrations involved (emergency and response measures).

- *Realism.* The risk of flooding can never be wholly eliminated by structural and non-structural measures, there can only be a reduction in the risk. I.e. 'floods cannot fully be controlled'.

- *Environmental considerations.* Floods are important in the functioning of ecosystems and are a basic element in the transport of sediments and in the renovation of the physical substratum. Furthermore, floods control the development of plants and animals in the fluvial ecosystem. For these reasons, controlled floods are increasingly being used in developed countries as part of management policies. These controlled floods re-establish the equilibrium of ecosystems that have been altered by flow regulation with river training measures and reservoirs.

- *Prevention.* Problems arising from floods should be prevented before future interventions are needed. For example, the prevention of human occupation of flood-prone areas is the best way to avoid those interventions. The problem of floods should be moved from structural responses to land planning measures.

- *Transparency.* An effort should be made to present the assumed risks in any measures taken and to explain their objectives. For example, risk maps could be made available to the general public.

- *Integrated actions.* Only the integrated application of a package of measures, such as natural water retention, implementation of preventive actions against risks, raising awareness of the remaining flood risk and individual preventive measures, can lead to improved protection against floods.

Level of desired protection

The definition of the desired and/or tolerated protection levels against floods is a difficult task without a unique answer. On the one hand, the adoption of a high level of protection implies large investments, while, on the other hand, it is not desirable to suffer frequent flood damage. Hence, flood risk policies should relate to a certain level of tolerated damage (which has been collectively accepted) and to a certain level of desired protection (which has been collectively defined).

An important dimension to flood risk in trans-boundary rivers is that protection works in one country can affect the standard of flood defence in others.

From the available information, there seems to be some degree of agreement on designing urban protection at between 50 and 200 years, and the protection of agricultural areas at a lower level. Figure 6.1 shows an example of the level of protection against floods as a function of the land use.

Figure 6.1 Example of level of protection against floods as a function of the land use [EEA, 2001].

Two types of measures are mainly considered to achieve the level of protection desired or, at least, tolerated:

- Structural measures for flood control;
- Non-structural measures to control the impact of floods.

The choice often depends on the type of flood and the prevailing specific local circumstances.

Structural measures

Structural measures have been used for a long time to prevent floods and to mitigate their impacts, by adjusting the development and propagation of floods, by reducing the level of run-off or by protecting specific areas. Three main categories of structural measures can be distinguished:

- Measures which reduce the *peak discharge* such as flood control reservoirs, areas for controlled flooding, soil protection, afforestation, etc.;
- Measures which reduce the *level of flooding* such as river channelisation, levees, cleaning of riverbeds, etc.;
- Measures which reduce the *duration of flooding* such as road and railway culverts, bridges, etc.

Structural flood protection measures are expensive. The protection gained must justify the expense. This justification becomes more difficult when the safety targets are higher. At the same time, account must be taken of how the intervention in the river basin will affect people living upstream and downstream. Some common structural measures are:

- *Dams and reservoirs.* Dams have largely been used to prevent flooding, either as pure flood protection reservoirs or in combination with other objectives (hydropower, irrigation, drinking water, etc.). Their impacts on up and downstream river stretches depend mainly on site specific circumstances and whether they are situated in (small) tributaries or in the main stream.

- *River channelisation and diversions.* In many countries, river channelisation has traditionally been a means of protecting urban areas from flooding, although occasionally it has also been applied in agricultural areas.
  Another option consists of the diversion of peak discharges by artificial river channels or the removal of natural river meanders (bend cut-offs). This may lead to either an increase in flow velocity and bed slope or to the re-routing of water towards less vulnerable areas.
  It has been shown that river channelisation and the loss of the natural water-retention capacity in river basins can in some cases increase peak discharges significantly. For this reason, measures such as the re-alignment of levees and implementation of flood retention areas have already been undertaken in some European countries and the USA.

- *Levees.* Dykes were constructed in major river basins many centuries ago to make more efficient use of parts of floodplains. However, when levees are overtopped, the levee material will erode, which will cause breaching in a very short time. Until recently, levees were reinforced and made higher after every large-scale flood, which increases flood risks. The maintenance of levees is a continuous task and, in the interest of safety, must not be neglected.

- *Artificial flooding areas.* Another often-applied technique is the implementation of artificial flooding areas and the opening of levees during floods. In a sense, this measure tends to recover some of the natural storage capacity of rivers that was present before channelisation.

- *Plant and habitat development.* Vegetation and habitat development (by means of engineering works) are used to stabilise riverbanks and to provide diverse habitats. Techniques include planting on bare soil and on steep rock embankments using stake-held roots, use of plant matter as a foundation, geo-textile protection and plant anchorage.

Non-structural measures

Over recent decades, so-called non-structural measures have been gaining importance. These measures do not have a direct effect on the flood discharge, but aim to reduce the damage by means of management policies. The application of non-structural measures is increasing in support of the existing structural measures, because it is apparent that

the latter enhance the development of communities, which feel safer with these structures.

In general, there are three groups of non-structural measures:

- Measures which reduce the *possible impact of a flood* on existing structures (flood proofing) such as precautionary building, barricades, reinforcement of buildings, etc.;
- Measures related to *land-use planning* in floodplains such as the definition of safety zones, the restriction of uncontrolled building, etc.;
- *Early warning systems* and *flood emergency and relief measures*, comprising for example, real-time flood forecasting and routing, flood emergency and relief (response, evacuation, relief and recovery) plans, flood fighting, etc.

Some common non-structural measures are:

- *Flood proofing.* Flood proofing or precautionary building means adjusting modes of construction in areas susceptible to flooding so that they are able to cope with a flood of a certain magnitude. An example is the construction of buildings with at least two storeys, which would be less vulnerable to flood damage.

- *Floodplain zoning, regulation and insurance.* Floodplain management or planning controls the use of land. The first step is to elaborate flood risk or hazard maps for different flood magnitudes, in which the main variables (water depth, flow velocity, flood duration, etc.) are defined to inform the public about the potential flood risk in a floodplain. The maps provide information for communicating the degree of flood risk to the authorities and the public, enabling an open debate on the most appropriate flood prevention and protection measures.

- *Forecasting, routing and early warning systems.* Forecasting, routing and early warning systems are essential in order to reduce the risk to human life. Depending on the type of river basin and available data, it is possible to some degree to estimate how floods are likely to develop over a particular period. It is, therefore, essential to increase the length of this period by improving forecasting techniques and to use them as a proactive tool to prepare certain mitigation measures and/or actions.
  Early warning systems incorporate tools to predict floods through the collection of relevant rainfall, catchment and river data, reservoir water levels and an integrated assessment of this information. The approach to flood forecasting depends on catchment characteristics. Priority should be given to improve forecasting by means of applying well-tested models.

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Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 2

Issues

Table of contents

B 2.1

Human rights and conflict management

Code	B 2.1
Teaching topic	Human rights and conflict management
Time (hrs)	2
Content/Skill focus	Human Rights and conflict management: - Linking rights and needs - The rationale of conventions
Objectives	1.To enhance understanding of the role of Human Rights in Conflict Management. 2. To deepen awareness of the rationale behind conventions
Learning methodology	Group exercise and small group discussion
Trainer/facilitator guide	'Human dignity exercise' (see Parlevliet) Apply to UN watercourse convention (small group work)
Course book	
Course reader	M. Parlevliet, 2002, Bridging the divide: exploring the relationship between human rights and conflict management. *Track Two* **11**(1) P. Gleick, 1998, The Human Right to Water. *Water Policy* **1**(5)
Further reading	United Nations, 1948, Universal Declaration of Human Right Organisation of African Unity, 1981, African Charter on Human and People's Rights

B 2.2

Water security and peace

Code	B 2.2
Teaching topic	Water security, and peace
Time (hrs)	2
Content/Skill focus	Water security, and peace
Objectives	To understand the links between security, peace and access to water in a regional context
Learning methodology	Conventional lecture with ample reference to Southern Africa
Trainer/facilitator guide	
Course book	M. Falkenmark: "Hydrosolidarity through catchment based balancing of human security and ecological security"
Course reader	K. Asmal: "Water is a catalyst of peace." *Water Science and Technology* 43(4): 24-30 P. Vale: “Water and Sovereign compromise in Southern Africa"
Further reading	

Hydrosolidarity through catchment based balancing of human security and ecological security *

Background memo to a Virtual Water Forum debate

Malin Falkenmark, SIWI, Stockholm

This memo summarizes the above problematique, based on a SIWI Seminar in August 2001 on "Water security for cities, food and environment - Towards catchment hydrosolidarity"

Introduction

In a catchment, besides water security for the inhabitants, water is involved also in providing both food security, since large amounts of water are consumed in local food production, and environmental security, linked to a whole set of water-related threats from droughts, floods, land degradation, bacterial diseases, and toxic pollution, the latter threatening both human health and ecosystems. As a consequence, water has to be managed in such a way that attention can be paid to the water-related linkages between all three modes of human security.

The situation will be rather different under humid as opposed to arid conditions. In the humid zone situation where water pollution is the dominant problem, upstream/ downstream problems are principally easier to solve - the issue is not one of a zero-sum character. In the arid zone, especially at high levels of water crowding, i e many people polluting each flow unit of water, upstream societal priorities influence downstream opportunities. If water for agriculture is given priority, less will be available for downstream users. Similarly, low upstream priority to water pollution abatement will reduce water usability downstream.

Security dimensions

Two dimensions of *human security*, closely linked to water have to be highlighted: Water security in terms of safe household water is fundamental for human health. Food security is in poor countries, especially in rural areas, closely linked to local production. Food security offers a complex problematique in the sense that it is - besides a well functioning food distribution to all inhabitants - composed of both nationally produced and imported food. Food production involves both irrigated and rainfed agriculture. Due to the increase in consumptive water use involved, it is difficult to increase crop production for a growing population without consequences for catchment ecosystems, aquatic as well as terrestrial.

* Downloaded from: http://www.siwi.org

Ecological security is here seen as the protection of crucial ecological goods and services in aquatic as well as terrestrial ecosystems. The link to other water management issues in the catchment is represented by the water determinants of a particular ecosystem: basically the impacting of such determinants by human activities is equivalent to impacting the relevant ecosystem. Typical water determinants may be both quantity-related and quality related. This means that both changes in consumptive water use and in water pollution will be of relevance for the ecosystems.

All these three modes of security are linked through the dynamics of the water passing through the catchment on its way from precipitation over the catchment to outflow at the mouth. This means that water management will involve compromise building efforts. Some uses however involve a literally consumptive use, while others produce return flows making the water available for downstream reuse. Conventionally only liquid or socalled blue water is being considered - the perspective of engineers and economists has not yet been extended to uses linked to evapotranspiration, i e socalled consumptive use or green water "losses" from the basin. Efforts to reach hydrosolidarity while securing both water, food and environmental security will therefore have to encompass both sequential reuse of blue water along the river system and proper attention to green/blue water interactions as well as pollution loads, degrading the usability of the accessible water.

Water needs of ecosystems tends to remain a fuzzy concept. What the concept generally refers to is the river flow needed for healthy *aquatic ecosystems,* a concept referred to by the term "environmental flow". It was stressed that *terrestrial ecosystems* are however equally water dependent, although water appears in different functions - not as habitat but as building matter, nutrient carrier and cooler. In the analysis, three scales of ecosystems have to be distinguished: seen in a *global* perspective the terrestrial ecosystems in the temperate and tropical zones involve a massive consumptive water use, representing almost 90 percent of the whole evapotranspiration/green water flow from the continents. Seen in a *catchment* perspective, protection of ecosystems will basically demand a balancing of the precipitation over the catchment between humans and ecosystems. In the *local* scale, finally, ecosystem protection tends to be place-based and linked to endemic species, biodiversity etc.

Hydrosolidarity

Solidarity means a willingness to restrain one´s freedom. Adapting to the hydroclimatic constraints of a catchment will involve compromise building and depend on the existance of adequate institutions able to take crossectoral approaches. Societal ability to cope will be a fundamental precondition, involving human ingenuity both in terms of societal approaches and technical solutions. *Sharing principles* will evidently have to be found for the unavoidable compromise building process in a specific river basin . Starting point will have to include attention to both international conventions, to different modes of "human livelihood rights", to long term productivity of the basin soils, and to ecosystem resilience through biodiversity to surprising catastrophies.

It is interesting to note that the issue of downstream water security was never really raised in the Seminars. It was however fully evident from the dry climate regions that *river depletion* is a real problem that has to be given adequate attention in the future and

for which mitigation efforts are urgent. It follows from the water balance equation that, with an increasing consumptive use of water linked to an intensification of agricultural production, river flow may decrease in response. A further consequence of such a phenomenon is that the dilution flow for introduced pollution load will also diminish and that, as a result, pollution levels will increase even more.

Thee are however many obstacles to overcome *Conceptual obstacles* originate from the compartmentalized approach taken by most water professionals, representing typical differences in their sectoral focus. Second, there are a set of scientifically based paradigm locks which originate from a deep-going sectarianism within science incompatible with water's large complexity in both roles and functions: e g the quantity/quality lock where the former is linked to geoscience, the latter to bioscience; the hydrology/ecology lock where, similarly, the former is a geoscience issue, the latter a bioscience issue. There is also the difference between visible and invisible water where engineers evidently have their focus on visible water, possible to control and regulate (blue water). The invisible water in the soil, on the other hand, has up til now generally tended to vanish from focus. Through the close interdependence, land use changes may be reflected in altered consumptive use and therefore also in river runoff.

Also *human attitudes* and *societal momentum* contribute to time delays. Strong sectoral interests are for example widespread over regions with large scale irrigation. Institutional mechanisms have evidently to involve competence to make crossectoral analyses on the catchment level, and establish negotiating arenas for the compromise building. Ways have also to be found for the financing of institutions of joint interest.

Final remarks

Returning now to the basic question of how hydrosolidarity between upstreamers and downstreamers may be approached in a realistic way, a set of key challenges were identified at the three SIWI seminars. What happens to water after use has to be seen as a fundamental component of the management equation. It is for example evident that the water quality perspective has to be properly entered when discussing water quantity challenges. The pollution level is fundamental to the usability of a particular water source, as reflected in the large scale unhealth typical for developing countries. The considerable delay in ability to address this evident linkage is probably founded in the water quality/quantity paradigm lock, with the former founded in geoscience, the latter in bioscience.

Not much attention was paid in the Seminar debates to the upstream/downstream dimension of the hydrosolidarity problematique. A fundamental incompatibility remains to be addressed: the water balance related competition between on the one hand increased consumptive use upstream, linked to a potential expansion of food, forestry and bioenergy production, that involves blue/green water transformations, and on the other hand downstream stakeholder interests and ecosystems dependent on uncommitted blue water flow entering from upstream.

B 2.3

International water law regimes

Code	B 2.3
Teaching topic	International water law regimes
Time (hrs)	2
Content/Skill focus	International regime, UN Convention on International Watercourses
Objectives	1.To introduce the basic concepts of International Water Law 2. To introduce the principles of the convention 3. To clarify key concepts in the convention 4. To analyse the legal implications of the Convention in the national water legislation and policy
Learning methodology	• Brief input on principles and concepts • Facilitated discussions • Elicit understanding of rule, Principle of International Law and legal regime
Trainer/facilitator guide	
Course book	P. van der Zaag & P. Jose, International water law regime
Course reader	G.W. Sherk, G.W., P. Wouters and S. Rochford, 2000, Water Wars in the Near Future? Reconciling Competing Claims for the World's Diminishing Freshwater Resources The Helsinki Rules on the Uses of the Waters of International Rivers (August 1966) The UN Convention on the Law of Non-Navigational Uses of International Watercourses (1997)
Further reading	A. T. Wolf, 1998, Conflict and cooperation along international waterways. Water Policy 1(1): 251-265 H.H.G. Savenije, & P. van der Zaag, 2000, Conceptual framework for the management of shared river basins with special reference to the SADC and EU. Water Policy 2(1-2): 9-45 P. Van der Zaag, P., & H.H.G. Savenije, 2000, Towards improved management of shared river basins: lessons from the Maseru conference. Water Policy 2(1-2): 47-63 P. van der Zaag, I. Seyam & H. Savenije, 2002, "Towards measurable criteria for the equitable sharing of international water resources" Water Policy 4: 19-32

International Water Law Regime

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The root of the English word *rival* is from the Latin term *rivalis*,
which originally meant using the same stream (*rivus*).
(Biswas 1993: 181)

1 Introduction

More than 40 percent of the world population lives in some 250 river basins that are shared by more than one state. Some countries, such as Botswana, Bulgaria, Cambodia, the Congo, Gambia, the Sudan, and Syria receive 75 percent or more of their fresh water from the river flows of upstream neighbours.

The last few years have seen a remarkable convergence throughout the world concerning the central role given to the river basin as the management unit of international waters. For the SADC, this is exemplified by the signing, in 1995, of the 'Protocol on Shared Watercourse Systems', which came into force in September 1998. (The revised 'Protocol on Shared Watercourses in the SADC Region' was signed by all Head of State of SADC except the DRC in August 2000. The new Protocol will come into force, and replace the earlier Protocol, once two thirds of SADC member states have ratified it.) For the EU, both the UN/ECE 'Convention on the Protection and Use of Transboundary Watercourses and International Lakes', signed in March 1992, and the EU 'Framework for European Community Water Policy', which was formally adopted in December 1997, assign to the river basin central managerial roles.

General principles and critical issues

At a national scale, governments appear to base their policy for resource management on a number of 'emerging' principles that have general validity. Such principles are often also underlying international policies. Box 1 provides a brief description of 6 important management principles. In international law some more specific principles are used with regard to international river basins. These are further discussed in a separate section (below).

Box 1: Emerging principles of the management of international water resources

- *sovereignty principle*: each nation has the right to develop its own policies, laws and institutions and their own strategies for natural resources development and utilisation
- *transboundary principle*: upstream water users have a responsibility towards downstream water users, and vice-versa; this principle is in a sense the extension of the equity and precautionary principles across national borders
- *equity principle*: all people have basic rights of access to resources for their survival and development; no groups in society should be put at a disadvantage in this respect
- *intergenerational principle*: future generations should not be deprived from access to an adequate resource base
- *water-as-an-economic-good principle*: users should pay the economic value of the water used, provided that the price of water is affordable and that this principle does not conflict with the equity principle (which is higher on the ladder)
- *polluter-pays principle*: he who inflicts damage on the natural resources system should pay for the damage
- *precautionary principle*: governments are obliged to protect citizens against risks and from disasters, even if such risks have not yet been established by scientific proof; this principle applies to prevent or reduce pollution against specific pollutants

A number of critical issues have emerged with respect to the sharing of international water course systems, particularly rivers. These include:

- River basins do not respect village, district, provincial, and national boundaries. Too often, we have attempted to fit the water into these administrative and institutional boundaries, rather than to design institutions that fit the (physical and spatial characteristics of the) resource. As a consequence, there often is an administrative/institutional void when dealing with the management of water resources. This is especially true at the transnational level.

- Management of water resources has generally concentrated on surface water, while insufficient attention has been given to groundwater, soil moisture ('green water') and related aspects.

- Perhaps the biggest problem in sharing an international water resources system is its sheer scale and the opaqueness of system interactions over large distances (upstream and downstream). For instance, it is difficult to see, let alone quantify, the consequences of upstream land use changes on downstream flood levels. This opaqueness may result in unforeseen negative consequences of human interventions, which are difficult to correct and may give rise to tensions between riparians (countries sharing the basin).

- Within the same international river basin, national interests may differ; thus nations may develop diverging policies and plans which are not compatible. This is the sovereignty dilemma: to what extent may individual countries develop and use resources found within their territories, and to what extent do they have to consider interests of riparian countries, and the 'common interest' of the river basin as a whole? Upstream users often are reluctant to take the problems of downstream users at heart. One of the biggest challenges in sharing international rivers is to identify development strategies whereby all riparians eventually benefit from an equitable allocation of costs and benefits.

2. The International Water Law Regime

From the early times, the utilisation of water resources has been a major concern for States. The sharing of waters has been considered part of States affairs ever since. With the time different principles and rules were adopted to govern the allocation of waters. Sometimes such principles and rules were controversial, in light of the differing interests of the parties involved.

The sharing of water in international rivers is a matter of principles and rules that developed over centuries. Therefore, the international law regime is considered a result of international (universal) conventional and customary law governing the shared utilisation of waters of international rivers.

From the early 1950s, international controversies over water affected most regions of the world. The increasing water demand for different uses intended to meet human needs has translated into increased pressures on international rivers, and increased competition. This clearly posed a new challenge: how can the uses of International Waters promote peace, through balancing the satisfaction of interests and development ambitions of riparian States.

Learned international bodies, such as the International Law Association (ILA) began studying the law applicable to these disputes. The ILA developed the Helsinki Rules (1966).

The first, and most fundamental, principle governing the sharing of international waters is **the principle of "reasonable and equitable utilisation"**. This is enshrined in the UN Convention of 1997, and first defined in the Helsinki Rules of 1966. The legal source of this principle goes back to the United States Common law doctrine. In 1907, the courts formulated **the principle of "equitable apportionment"** in the Kansas versus Colorado case.[5]

[5] Kansas vs Colorado case (1907) became famous as the first case resolving which the US federal common law adopted the rule of equitable apportionment.

The general principle of the ILA's work on international water law is contained in Article IV of the Helsinki Rules which provides that the principle of equitable utilization governs the use of the waters of international drainage basins.

Box 2: The principle of equitable and reasonable use, Helsinki Rules

Article IV of the Helsinki Rules:

Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin.

In the relations among riparian states, the principle of reasonable and equitable utilisation underlines equal rights and not equal apportionment. The principle therefore defines access rights to water, and its quality. The principle does not quantify how much water each riparian State is entitled to.

The International Law Association, by adopting Helsinki rules, listed relevant elements to measure reasonable and equitable utilisation of international drainage basins (art. V).

Since the Helsinki Rules were adopted in 1966, States have frequently used the principle of reasonable and equitable use as a guiding principle in the use of waters of international drainage basin, even though States recognised that the Helsinki Rules were not rules of International Conventional Law. This notwithstanding, due to the influence they gained world wide, the Helsinki Rules are generally considered as Customary Law.

Ever since the Helsinki Rules were formulated, the criteria of equity and reasonable utilisation have been matters of concern and debate.

As States developed economically, and increased their demands for water, legal, economic and other factors were considered in order to determine the quantity of water each riparian State was entitled to on the basis of the equitable apportionment principle.

As equitable apportionment was only formulated as a general guideline, it was sufficiently broad and flexible to be applied to different circumstances with differing applicable laws.

The economic aspect was interpreted in two ways; namely (a) the degree to which a riparian State was dependent on the water; and (b) the benefits derived from water use.

3 Towards the UN Convention (Wouters 1997)

The Helsinki Rules have played an important role in the codification and progressive development of this branch of international law. States refer to these guidelines to the present day and some countries have recommended that elements of the Helsinki Rules be included in the United Nation's convention on watercourses.

In the late 1960s, following the failure of the UN General Assembly to have the Helsinki Rules adopted as guidelines governing international water law, the United Nations decided to assign the topic to the International Law Commission (ILC) for detailed study. After close to twenty-five years work on the topic, the ILC produced a document that contained thirty-three Draft Articles (1991, revised in 1994) and submitted that to the UN General Assembly with the recommendation that it be adopted as a framework convention.

The Sixth Committee of the UN General Assembly was convened as a Working Group of the Whole and met in October 1996 and in March 1997. The meeting was controversial. Issues related to transboundary water use that divided States at the beginning of the century resurfaced in the UN debates. At the centre of the discussions were issues relating to the identification of the substantive rules that determined the parameters of watercourse States rights and obligations:

- What limits apply to watercourse States' entitlements to use transboundary waters?
- How are the various factors to be weighed in the overall assessment of an equitable and reasonable use?
- Where a conflict of uses arises, what rule determines which use should prevail?
- What role does "harm" play?

State responses to these issues varied in accordance with their location - upstream or downstream - on the watercourse. States that had no transboundary watercourses adopted an environmental protectionist position, which coincided with the view of downstream states that the principle of no-harm should govern water resource development.

One central issue was at the core of disagreement among states. These related to the substantive rules contained in Articles 5 and 7 of the 1994 ILC Draft and the relationship between these. Article 5 contains the principle of equitable and reasonable utilisation, whereas Article 7 refers to the no significant harm principle.

States tended to adopt positions that favoured their particular interests. Upstream states supported rules that gave them control of the waters that originated in their territory, in line with the doctrine of absolute territorial sovereignty. In contrast, downstream states appealed to the doctrines of prior appropriation ('vested rights') and absolute territorial integrity, and embraced an approach that would provide them with the unaltered flow (in terms of quality and quantity) of the waters that entered their territory. Clearly, such positions proved to be irreconcilable.

The fact that the vote on the substantive rules contained in Articles 5 and 7 was so closely divided is significant in itself. From such a result it can be deduced that both upstream and downstream States find strengths and weaknesses in the final formulation of the Articles. This could attest to the relative fairness of the compromise finally reached regarding the substantive rules: It favoured neither upstream nor downstream States. Certainly, a primary rule of allocation based on "equitableness and reasonableness" should promote such an end.

Box 3 Changes in the wording of articles 5 and 7 of the UN Convention

Article 5

1. Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal *and sustainable* utilization thereof and benefits therefrom *taking into account the interests of the watercourse States concerned*, consistent with adequate protection of the watercourse.

2. Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to co-operate in the protection and development thereof, as provided in the present Convention.

[emphasis added to show changes to 1994 ILC Draft].

Article 7

1991 ILC Draft:
Watercourse States shall utilize an international watercourse in such a way as not to cause appreciable harm to other watercourse States.

1994 ILC Draft Articles (this version favoured a no-harm approach to watercourse development):

1. Watercourse States shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other watercourse States.

2. Where, despite the exercise of due diligence, significant harm is caused to another watercourse State, the State whose use causes the harm shall, in the absence of agreement to such use, consult with the State suffering harm over:
(a) the extent to which such use is equitable and reasonable taking into account the factors listed in article 6;
(b) the question of ad hoc adjustments to its utilization, designed to eliminate or mitigate any such harm caused, and, where appropriate, the question of compensation.

UN Convention of 1997:

1. Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

2. Where significant harm nevertheless is caused to another watercourse State, the State whose use causes the harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of Articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.

The practical application of the substantive rules of the Convention is achieved under Article 6 which lists the factors which must be taken into account when deciding what an equitable and reasonable use of an international watercourse actually is. These include geographic, hydrographic, climatic, ecological and other natural factors, the social and economic needs of the watercourse states concerned, the population

dependant on the watercourse, the effects of the use of the watercourse by one state on other watercourse states, existing and potential uses of the watercourse, conservation, protection, development and economy of use of the resources of the watercourse, and the availability of alternatives to a planned or existing use.

Finally States recognized this and adopted rules that reflect the concomitant rights and obligations of watercourse States. By a vote of 42 States for, 3 against (China, France and Turkey) and 18 abstaining, the Committee adopted the text of the framework convention. The most significant change is the evident shift towards the endorsement of the principle of equitable and reasonable utilization as the primary rule of the project. This is reflected in the texts of Articles 5 and 7.

In May 1997 the General Assembly of the United Nations finally adopted the Convention on the Law of the Non-Navigational Uses of International Watercourses by 103 votes in favour to 3 against (Turkey, China, Burundi) with 27 abstentions. The Convention was opened for signature up to the year 2000.

4 Legal Principles

In discussing legal and regulatory aspects of the management of international river basins, it is useful to distinguish international from national legal frameworks. Ideally, the country specific laws pertaining to the use of national waters should be consistent with those principles widely accepted to apply to international waters. If not, national water laws and regulations will require to be harmonised between riparian countries. Riparian countries should consider regional and global agreements and common law, but also the principles behind local practices regarding the use and sharing of water resources that have persisted.

A wide consensus appears to exist among countries about the principle of international cooperation concerning cross-border basins (the Co-operation Principle) and that of Optimal Utilisation. The importance of this observation is difficult to underestimate, for countries cannot begin to share a resource without first agreeing about some basic legal principles.

As observed above, two key principles form the foundation of the international water law regime:
- the principle of equitable and reasonable utilisation
- the principle of the obligation not to cause significant harm.

This will be further elaborated below. First, it is important to note that whereas in the Helsinki rules the central concept is ‘international drainage basin’, the ILC draft law and the UN convention use the term ‘international watercourse’ (Box 4). The global principles as defined by the above institutions have been translated into regional agreements, such as the SADC Protocol of Shared Watercourses (2000).

Box 4: 'International drainage basin' or 'international watercourse'?

Helsinki Rules: an *international drainage basin* is 'a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus' (Article II).

ILC Draft Law and **UN Convention**: a *watercourse* is 'a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.' An 'international watercourse' then is 'a watercourse, parts of which are situated in different States' (Article 2).

Operationalising the principles

Whereas the philosophy behind these rules are laudable and widely shared, problems begin when the general principles must be specified for a particular situation. In general, the problems arise when basin states fail to take the interests of other riparians into account. Upstream basin states may emphasise the fact that they exercise 'absolute sovereignty' over their territory when pursuing projects, while downstream countries may emphasise territorial integrity when challenging upstream developments. The utilisation of shared water resources, therefore, requires riparian countries to acknowledge the principle of 'limited sovereignty', or, phrased positively, to accept the principle of 'community of interest'.

The definition of watercourses or drainage basins as being 'unitary wholes' may be interpreted differently depending on each country's perspective. In large river basins, upstream countries may consider a tributary to a main river as a river basin in its own right. It then becomes easy to ignore harmful effects of interventions on downstream users. Although such a way of thinking is understandable from the upstream country's point of view, it is certainly not the intention of the principles laid down by ILA, ILC and the UN. It should therefore be emphasised that in practice a watercourse or basin has as its downstream limit either the sea, or, in some special cases, a desert. The correct way to refer to all other watercourses or basins should be 'sub-basins'.

The backbone of the Helsinki Rules and the UN Convention is formed by two principles: the principle of equitable and reasonable use (article 5 in Box 3), and the principle not to cause significant harm (article 7).

The Principle of Equitable and Reasonable Utilisation

Reasonable and equitable utilisation of waters of international rivers was confirmed as a guiding principle when the UN Watercourse Convention (May 1997), adopted in Article 5 and 6 the reasonable and equitable utilisation as the governing rule for water utilisation among riparian States.

Box 5: Comparing Article V of the Helsinki Rules with Article 6 of the UN Convention

Article V of the Helsinki Rules

I What is a reasonable and equitable share within the meaning of article IV to be determined in the light of all the relevant factors in each particular case.

II Relevant factors which are to be considered include, but are not limited to:

1. The geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
2. The hydrology of the basin, including in particular the contribution of water by each basin State;
3. The climate affecting the basin;
4. The past utilization of the waters of the basin, including in particular existing utilization;
5. The economic and social needs of each basin State;
6. The population dependent on the waters of the basin in each basin State;
7. The comparative costs of alternative means of satisfying the economic and social needs of each basin State;
8. The availability of other resources;
9. The avoidance of unnecessary waste in the utilization of waters of the basin;
10. The practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and
11. The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

III The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article 6 of the UN Convention

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

   (a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;

   (b) The social and economic needs of the watercourse States concerned;

   (c) The population dependent on the watercourse in each watercourse State;

   (d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States;

   (e) Existing and potential uses of the watercourse;

   (f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;

   (g) The availability of alternatives, of comparable value, to a particular planned or existing use.

2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation.

3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article 6 lays down the relevant factors to determine the reasonability and equity of use of international watercourse (see Box 5). These factors include the natural characteristics of the watercourse (geography, hydrology, climate and ecology), the social and economic needs of the states concerned, the population dependent on the watercourse in each state, the existing and potential uses of the watercourse, the costs of development and protection, the effects of the use of the watercourse in one state on other watercourse states, and the availability of alternatives, of comparable value, to a particular planned or existing use.

As Patricia Wouters has observed, hydographic factors relate generally to the measurement, description and mapping of the waters of the watercourse, to the properties of water, including water flow and to its distribution, including the contribution of water to the watercourse by each watercourse State.

The Convention's reasonable and equitable utilisation principle is doctrinally assumed as "…attaining maximum possible benefits for all watercourse States and achieving the greatest possible satisfaction of all their needs, while minimising the detriment to, or unmet needs, of each".[6]

Reasonable utilisation itself means that a watercourse State has to take all possible measures to ensure that the utilisation of water is not wasteful. In addition, equitable utilisation means that in utilising water the needs of others have to be considered, which the McCaffrey Second Report seems to suggest.[7]

The question is in how far such commentaries legally binding as guidance of interpretation. In fact, those commentaries were not adopted as rules of international law but they provide a quite consolidated understanding of the matter, which is not reasonable to ignore for purposes of strengthening International Law as such.

It is, however, important to note that the Convention does not give a weight of each of the factors in the process of quantifying water allocations for each of the riparian States. That will have to be done during negotiations, when the relevant principles of the Convention have to be applied and translated into more concrete measures.

The factors mentioned in Article 6 are prone to subjective interpretations by the riparian states. "Clearer criteria are needed by which to judge, for instance, what constitutes a reasonable level of per capita water use given the total amount of water available in a river system, and what constitutes a fair apportioning of water among nations sharing common sources" (Postel 1992: 189).

The Principle of the Obligation not to Cause Significant Harm

Apart from embracing the reasonable and equitable utilisation principle, the UN Convention also adopted the "Obligation not to Cause Significant Harm" (Article 7).

[6] 1997 International Law Commission, p 97

[7] For more details see " Second Report on the Law of Non-Navigational Uses of International Watercourse, S. McCaffrey, UN Doc.A/CN.4/399,Y.B.I.L.C. Vol. ll, Part 2, 87, 132 (1986)

The inclusion of this principle must be considered a major development sine the Helsinki Rules, which did not include this principle.

The problem, however, arises how "harm" can be identified. The key problem is to establish a measure which determines when exactly harm should be considered significant.

So far, legal experts have suggested that the harm will be considered significant when it doesn't allow the normal running of productive activities and health facilities, which as an immediate consequence, affects vital needs of the population. This harm has to be a direct consequence of (a) a reduction of water flow; and (b) a reduction or altering of the quality of water (e.g. as a result of pollution).

Reconciling the key principles

An important question surrounding the legal aspects of international rivers is: which comes first, the right to equitable and reasonable use or the obligation not to cause significant harm. Those riparian states with a stake in the *status quo* stress the importance of the latter principle (which appears to recognise established uses however inequitable these may be), while those riparians who lagged behind in water development use the former principle to claim waters already used by 'more developed' riparians. This is, however, a false dilemma. Both principles apply concurrently and are two sides of the same coin. They convey the basic tenet that riparians have rights *and* duties in the uses of water resources, in line with the second principle of the Rio Declaration:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and development policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. (UNCED 1992: 9)

Some other issues of international waters (Gupta 1996: 58-62)

Boundary demarcation
When a river forms the boundary of two states, the precise nature of the boundary is often in dispute. Where a river crosses a border between two countries, where the water flow is perpendicular to the border, the situation is often beyond dispute. However, where a river forms a boundary between two countries, with one bank being owned by one country and the other by the second country, the boundary demarcation is more complicated. During medieval times the banks were sometimes considered the boundary, with the river being '*res nullius*', i.e. it belonged to nobody. Sometimes the river was considered '*res communis*', belonging to both countries.

One common practice is to define as the boundary the *median line*. The median line is the imaginary line equidistant from either river bank, also corresponding with the

geometric centre of the river. This creates complications for navigation purposes, as the depth is a more relevant feature than the breadth for navigation. The other practice is the *thalweg line*, which is the deepest part of the river or the median line of the deepest channel. When then river moves because of natural causes, then the general rule is that if it moves suddenly, the boundaries remain as they were, but if it moves gradually, the boundaries would have to follow the shifting line of the water course.

Navigational uses
Three principles with respect to the navigational uses have crystallised over time:
a) the principle of freedom of navigation and of commerce for the riparian states
b) the freedom of commerce, but not of navigation of non-riparian states
c) the duty to consult and settle all matters concerning navigation by common agreement among riparian states (Congress of Vienna, 1815)

Appeal and arbitration

Conventions, such as the convention on the law of non-navigational uses of international watercourses, normally define procedures for settling disputes. The first defined step is to resolve the dispute bilaterally through negotiation. If unsuccessful, the next step is to see whether the disputing parties can agree to submit their dispute for arbitration to the river basin commission (if it exists) or if they can agree to appoint a third party arbiter. If all this is unsuccessful, there is, for the UN law, still the option that the Secretary General of the United Nations to appoint a Commission. If this also comes to nought, then the last remaining option for both parties is to submit their dispute to the International Court of Justice (ICJ). If one of the countries, however, also disagrees with this, the dispute cannot be arbitrated by the ICJ.

The International Court of Justice in The Hague, developed from the Permanent Court of Arbitration which was set-up in 1900 and which evolved into the Permanent Court of International Justice, which was established in 1922 by the League of Nations. The present International Court of Justice was formally established in 1945 and is an organ of the United Nations.

Only States may be parties to cases before the International Court of Justice, and a case can only be submitted if the other State agrees. The jurisdiction of the Court is not compulsory. With respect to the countries appearing before the Court, the judgement is binding, final and without appeal. However, there is no institutional body that can enforce the decisions of the Court.

Article 38 of the Statute of the court states that the Court's "function is to decide in accordance with international law such disputes as are submitted to it". This Article recognises the following sources of international law:
- international convention, whether general or particular, establishing rules expressly recognised by the contesting parties
- international custom, as evidence of a general practice accepted as law
- the general principles of law recognised by civilised nations
- judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.

In order to recognise a custom, there must be a demonstration that that is the constant and uniform conduct of states, and that their conviction of its obligatory nature conforms with juridical norms. The following customs are generally recognised:

- duty to cooperate and negotiate with a genuine intention of reaching an agreement
- prohibition to manage practices likely to cause substantial and lasting injuries to other states
- duty of prior consultation
- equitable utilisation of shared watercourses

5 Towards a strategy for the integrated management of shared basins (Savenije & Van der Zaag, 2000)

In this section we aim to define elements that would be part of a 'best' management strategy concerning international river basins. There is probably not one 'best strategy' that would apply to all river basins in the world. Local factors will influence the chosen strategy. What we *can* say of a best strategy is that it would address critical issues relating to political, legal-institutional, and technical aspects in an integrated manner, while respecting the criteria of efficiency, equity, and ecological integrity.

In order to be more specific, this concluding section suggests, and emphasises, three elements critical for any management strategy of international river basins: (1) the management of river basins should be based on integrated demand-and-supply management; (2) the public should have an active voice in the management of river basins, since it is the public who have a stake in their development; and (3) the management of river basins should explicitly recognise, and consciously exploit, the fact of spatial interdependencies among the entities making up the basin. (And, at a higher level, one can even think of multi-basin interdependencies within a region.) It is argued that any concerted strategy towards the integrated management of shared river basins should seriously consider, and incorporate elements of, demand-and-supply management, public participation, and regional integration.

Integrated demand-and-supply management

The dwindling water yields from our river basins, coupled with a continued increase in the demand for water, call for urgent, systematic, sustained and concerted actions at the basin scale. These actions should focus at both the demand side and supply side of the equation, simultaneously. This translates into a more efficient use of water.

Reducing the losses

Large engineering works such as storage facilities do not increase the basin yield, they merely buffer for fluctuations. The time-scale of the buffer depends on the storage capacity of the dam facilities; but, with increasing buffer capacity, the losses to the basin also increase. Here we refer to evaporation losses *occurring during the dry*

season. Evaporation from dams *during the wet season* may not be totally lost to the basin system as a whole, as the evaporated water may precipitate further afield (this does not occur in the dry season). By shifting open water storage to areas in a basin with lower evaporation rates existing water losses will significantly decrease (viz. the proposal to shift storage capacity in the Nile basin to the Ethiopian highlands, where evaporation is much lower than downstream; Postel 1992: 81).

There will always remain the need for storage facilities, and this need is likely to increase with the increasing demand for water. Dams, however, may not be the only answer. The most efficient storage facilities may in some cases be natural aquifers and soil moisture. If we wish to increase buffer capacities, and increase base flows in a basin, we should first consider the possibilities of increasing soil moisture and the recharge of natural aquifers through sound land use practices. This directly translates into sustainable cultivation practices that conserve soil and nutrients while increasing the infiltration of water into the soil.

Increasing the water yield

The only way to effectively increase the yield of a river basin is to concentrate efforts on the source of our water, i.e. rainfall. We should find ways to increase the efficiency of the use of water from rainfall. A more efficient use of rainfall means that the evapotranspiration from the natural vegetation, indigenous forests, pastures, arable agriculture etc. will be higher, and (biomass) production will increase accordingly. Evapotranspiration is thus not necessarily a loss. On the contrary, increased evaporation during the rainy seasons triggers more rain.

The above provides a recognition of the importance of dryland agriculture compared to irrigation. An important analytical distinction should be made between water that is used directly for biomass production (coined '*green water'* by Falkenmark (1995)), basically confined to vertical moisture fluxes, and runoff water feeding into aquifers and rivers ('*blue water'*), which is mainly a flow process along the horizontal axis. Integrated demand-and-supply management should re-emphasise the importance of 'green water' relative to 'blue water', the traditional concern of river basin organisations. Issues such as watershed improvement, sustainable land use systems, and soil and water conservation measures, which enhance the availability of 'green' water, should be put on top of the water management agenda.

Decreasing water demand

A more efficient use of rainwater for agricultural production, and an increased recharge of aquifers through improved soil and water conservation measures, themselves may result in a (temporary) decrease of demand for 'blue' water. In addition, policies should be developed at the various levels of the river basin, that consciously influence water demand. Demand management policies consist of an appropriate mix of institutional, educational, economic and legal measures. Inducing reduced demand for water, while enhancing the reliability of its supply, should be considered compatible with the efficiency and ecological integrity criteria. However, demand management may never jeopardise the equity criterion. At implementation level, integrated demand-and-supply management requires sectoral integration between e.g. departments of water, energy, agriculture and the environment; and calls for cross-border cooperation (see below).

Public participation

An institutional strategy should contain appropriate institutional arrangements for sharing international water both at the national level and at the river basin level. Moreover, dealing with international issues requires a certain balance between riparians in their capacity to handle water resources planning and management issues (see below).

Integrated management of water resources requires strengthening capacities at the highest *and* lowest levels within a basin. This insight calls for commitment at the highest political levels, as well as for the active participation of stakeholders and the general public in the process of international river basin management. The participation of stakeholders will assist in elaborating solutions that are sustainable and equitable, and may help to make national laws compatible with traditional norms and customs found at the local level.

Box 6: Legal action by private bodies against polluters of Rhine water

A number of Dutch private persons, water companies and lower administrative bodies, dissatisfied with the increasing pollution of the Rhine, initiated legal proceedings because they claimed to sustain damage.

In 1974 a Dutch lobby group of environmentalists and a few Dutch farmers brought an action before the District Court of Rotterdam in the Netherlands against a French potash mine, the greatest salt polluter of the Rhine. The Court declared the discharge of the waste salts by the mine unlawful under Dutch law and ordered the mine to pay compensation.

Private legal action was also taken before the courts in France. In 1981 ten Dutch complainants, among whom the province of North Holland, started proceedings before a French court objecting against licenses issued by French local government to the mine, allowing it to dispose waste salts in the Rhine. The French court annulled these licenses.

Legal proceedings instituted by (potential) victims before national courts against major individual polluters of the Rhine appeared to be an interesting supplementary means to abate the pollution of the Rhine. The legal principles developed by those courts are of a much wider scope and will be helpful in respect of other damages done to water quality and quantity in the Rhine, and possibly also in other basins.

(Source: adapted from Lammers 1989)

Box 6 gives an example of how stakeholders can have a very constructive impact on the process of developing international agreements. With the benefit of hindsight, one can say that in Europe environmental pressure groups have played an important role in bringing sustainability considerations higher on the political agenda and in enhancing a positive policy environment for international negotiations and cooperation. It is important to note here that the UN Convention on the Law of Non-Navigational Uses of International Watercourses contains a non-discrimination article, which gives stakeholders suffering transboundary damages access to the judicial system of the country where the damages originated (Box 7).

Box 7: The principle of non-discrimination in the UN Convention

Article 32: Non-discrimination

Unless the watercourse States concerned have agreed otherwise for the protection of the interests of persons, natural or juridical, who have suffered or are under a serious threat of suffering significant transboundary harm as a result of activities related to an international watercourse, a watercourse State shall not discriminate on the basis of nationality or residence or place where the injury occurred, in granting to such persons, in accordance with its legal system, access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on in its territory.

(Source: UN 1997)

Having said this, pressure groups, and environmental NGOs in particular, have often been, and still are, regarded a nuisance, if not a threat, by the formal actors in river basin management. Such an attitude may not be the most productive. Ideally, formal institutions should be outward-looking; have a positive attitude towards the public they are serving; be willing to expose themselves to public scrutiny; and, in general, be transparent in their operations (see Principle 10 of the Rio Declaration). Such institutions could, for instance, see it as their duty to provide educational services, in their respective fields, to primary and secondary schools.

Public participation has proved to work in Europe. It may be more difficult to pursue in the SADC region, where the majority of the population reside in rural areas, often lacking communication channels and therefore inadequately informed about the larger issues that (in)directly influence their resource base. Moreover, sheer poverty may be an important impediment for local stakeholders to involve themselves in these larger issues.

For SADC the challenge would be to foster the active participation of all stakeholders in water resources management. The provision of information is a pre-condition for private stakeholders, NGOs and the public at large to play constructive roles. Adequately informed about the state of their water resources, about development plans and on issues related to water resources management, they may become more directly concerned with the issue at an institutional level, and better realise their own responsibilities as citizens regarding water use and conservation. The dissemination of information may thus create public support for the steps taken towards sharing international water resources. In this context the responsible role of a free and well-informed press should be emphasised.

Water users should both be aware of international impacts of their water using activities and be able to influence international river basin management through, for instance, the newly established Catchment Councils in Zimbabwe, Catchment Management Agencies in South Africa and Regional Water Authorities in Mozambique.

Two major challenges exist: the first is to improve and strengthen the two-way communication between state and user levels within country, by means of effective catchment organisations. The second challenge is to harmonise such platforms of representation of user interests across borders, and to foster linkages between

catchment organisations across national borders (Figure 1). Strengthening these vertical and horizontal linkages will deepen, and give a more practical meaning to, the existing bilateral and multilateral agreements between States.

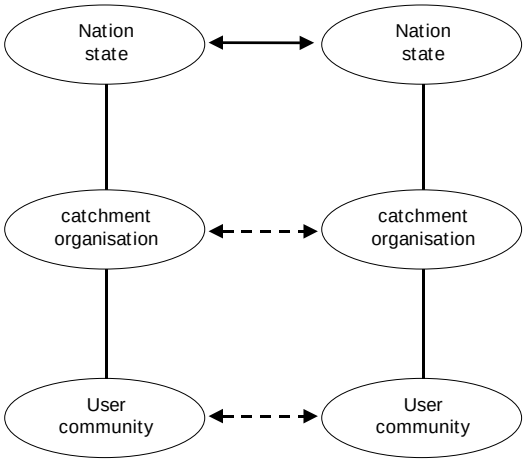

Figure 1: Missing links in international water agreements

Exploiting interdependencies

Having elaborated the part of our strategy involving integrated demand-and-supply management and public participation, we now turn to recognising the existence of spatial interdependencies within a basin, or even between basins at a regional scale. The strategy consciously aims to exploit these interdependencies to the advantage of the entire basin or region.

It is first required to create transparency in the management of the river basin system. Interdependencies can then be made visible and quantified, both in technical and socio-economic terms. The dissemination of this knowledge and the creation of awareness among water users, politicians and the public at large, should lead to the realisation that it is in everybody's interest to share the resources in a sustainable manner.

How can one create the public support for measures that at the short run, and at a small scale, seem less attractive to water users? Probably the EU countries have learned an important lesson. They would not think of letting a conflict over shared resources develop into a major conflict. The key word here is economic interdependence.

In the creation of the EU, which started shortly after the second world war and took many years to develop, the focus has always been on economic cooperation and trade, but an important underlying motivation was the establishment of durable peace. In the course of EU's development, member countries realised that sustainable and effective international relations require a 'levelling of the playing field'. Weaker members were supported by the stronger members to become more powerful 'players'. This approach, which might look foolish if one wants to achieve short term gains, appears to be highly effective if one goes for the long term and more sustainable benefits. When two partners sharing scarce resources are at equal footing and share ties of common interest (such as

trade links, economic, cultural and scientific cooperation), they think twice before letting a conflict escalate. There is too much to lose.

Between the EU countries there still are, and will continue to be, large differences in climate and in the availability of natural resources and cultural differences. Economic cooperation has enabled countries to no longer strive for self-sufficiency in food, energy or production of essentials. The common market and the confidence in peaceful cooperation has made this redundant. Now products are produced where resources are available and where the climate is favourable. In so doing the EU countries exchange 'virtual water'. They exchange this virtual water in the form of food, energy and industrial products.

The amount of virtual water involved in products can be impressive. Depending on the climate and the farming efficiency, 1 kg of rice corresponds with 1-5 m^3 of water. Similarly 1 kWh generated by hydropower corresponds with 4 m^3 of water at 100 m head difference. Of course the latter water use is non-consumptive. Thermal power production in Southern Africa, however, consumes about 3 l/kWh through evaporation. Similar computations can be made for industrial products. Trading these products, in fact, implies trading virtual water. Doing so allows an international community to produce these products there where conditions are most favourable, while the interdependency thus created, guarantees stability and sustainability of the supply.

SADC has made important steps in this direction. Sharing international rivers cannot be seen separately from economic cooperation, sharing a common identity and a political will to develop the region as a whole. However, as was the case in Europe, inequalities are large; in terms of economic development, but also in terms of availability of natural resources and climate. Therefore, initiatives such as the establishment of a *power market* in SADC (the Southern Africa Power Pool) are essential to sharing international waters and reducing evaporation losses in the production of thermal power. So would be the lifting of trade barriers and strengthening of a railway and transport network which would facilitate *trade of products*, and the development of a *food market* so that agricultural products are grown in those places where land and water resources are abundant and the climate is most favourable. In addition, this food market, which implies an increase of scale and consequent spreading of risk, could be an important instrument to mitigate drought within the region.

Creating and exploiting interdependencies thus involves the search for creative *deals* between riparians, when they negotiate their diverging interests. A case in point is the deal between the Netherlands and Belgium; Belgium commits itself to attaining certain quality standards of the Meuse water, while the Netherlands assures Antwerp of access to the Scheldt estuary.

Deals forged between riparians should contribute to the wider criteria of, first of all, equity, but also efficiency and ecological integrity. This becomes more important with the increasing scale of physical interventions in river basins, and particularly applies to inter-basin transfer of water. In the past, some SADC countries have transferred water from its original river basins without the consent of downstream countries. The SADC Protocol on Shared Watercourses fortunately rules out similar unilateral interventions in future.

6 Conclusions (Van der Zaag & Savenije, 2000)

From this chapter, the following lessons may be drawn:

1. Integrated management of shared water resources requires **triggers** and **opportunities**. Triggers can have the form of floods, pollution hazards, or acute water scarcity. In river basins where these triggers are absent it is hard to establish some form of joint management. In addition, political change, or the dissipation of international tension (e.g. the termination of Apartheid and the 'Fall of the Berlin Wall') offer excellent opportunities to break a deadlock and establish joint management arrangements.

2. A system of **technical communication and cooperation** is extremely important to support joint management of water resources. Particularly where the political environment is not favourable, technical cooperation is the most important instrument to maintain minimum levels of communication and to prevent conflicts to escalate. Through technical cooperation mutual trust and understanding is built-up.

3. **The playing field needs to be level**, implying that all countries should have adequate capacities to analyse and develop their negotiating position. Staff from riparian countries should have the same level of knowledge and speak the same "technical language". Joint capacity building efforts can be instrumental to facilitate communication and cooperation.
4. **Free access to** essential hydrological **information** (and information on water use) is essential to maintain mutual trust and technical cooperation. In Southern Africa international organisations (such as UNESCO and WMO) have played very important roles in this regard.

5. Besides the positive influence that **economic cooperation** has on the political environment, a system of open economic cooperation and a free access to markets is instrumental in facilitating the trade of 'virtual water'. Exchange of virtual water is arguably the most powerful tool to achieve more economic output per drop of water in arid regions. Much of the international tension on the sharing of water dissipates when the water is used where conditions in the river basin are most attractive for the production of a certain commodity. This facilitates the transition from national food self-sufficiency to food security

6. To reach agreements on sharing international water, **the playing field needs to be broadened**. A multi-track diplomacy, involving other sectors than directly related to the watersector (e.g. transport) can open-up new imaginative win-win propositions.

7. Often the **downstream country should take the lead** in this process. Broadening the scope to the coastal zone can offer new opportunities for negotiation, as was demonstrated in the case of the Rhine.

8. At the grassroots level **all the users of water**, including rainfed farmers and shrimp fishermen, **should have access to sufficient information** concerning the decisions taken about their water resource, and, through appropriate basin organisations, the right to *participate* in the decision-making process.

Finally, one can observe that the process towards sharing of international rivers may be as important as the result, and that this process is one of continuous learning.

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B 2.4

Game theory

Code	B 2.4
Teaching topic	Game theory applied to international rivers
Time (hrs)	1
Content/Skill focus	Game Theory: an introduction with special reference to international rivers
Objectives	To appreciate the relevance of game theory to shared rivers
Learning methodology	Conventional lecture; concepts applied to a case
Trainer/facilitator guide	- definitions and approaches - application to a shared rivers - fishing game (if time permits)
Hand out	Fishing game
Course book	Game theory, an introduction
Course reader	
Further reading	

Game theory, an introduction

Compiled by Annette Bos, UNESCO-IHE Delft, and Pieter van der Zaag, UNESCO-IHE Delft and University of Zimbabwe

1. Game Theory (McCain, n.d.)

Game theory is a distinct and interdisciplinary approach to the study of human behaviour. The disciplines most involved in game theory are mathematics, economics and the other social and behavioural sciences. "Games" are a scientific metaphor for a wide range of human interactions in which the outcomes depend on the interactive strategies of two or more persons, who have opposed or at best mixed motives. Among the issues discussed in game theory are

- What does it mean to choose strategies "rationally" when outcomes depend on the strategies chosen by others and when information is incomplete?
- In "games" that allow mutual gain (or mutual loss) is it "rational" to cooperate to realize the mutual gain (or avoid the mutual loss) or is it "rational" to act aggressively in seeking individual gain regardless of mutual gain or loss?
- Can moral rules of cooperation emerge spontaneously from the interactions of rational egoists?
- How does real human behaviour correspond to "rational" behaviour in these cases? Are people more cooperative than would be "rational?" More aggressive? Both?

Game theory has been applied to many different fields, such as the behaviour of large companies, strategic decision-making in wars, pollution, the over-exploitation of fisheries, the pumping race in aquifers, and generally, the “tragedy of the commons”.

The tragedy of the commons

The classical example is common pastures, on which, according to the theory, each farmer will increase her herds until the pasture is overgrazed and all are impoverished. Most of the applications have been in environmental and resource issues. The recent collapse of fisheries in many parts of the world seems to be a clear instance of "the tragedy of the commons." Other resources can also be understood as a tragedy of the commons, for instance overloaded internet connections, and highways. Highways are a common resource available to all car and bus commuters. However, car commuters make more intensive use of the common resource, causing the resource to be degraded (in this instance, congested). Yet the car commuters gain a private advantage by choosing more intensive use of the common resource, at least while the resource is relatively un-degraded. The tragedy is that this intensive use leads to the degradation of the resource to the point that all are worse off. In general, "the tragedy of the commons" is that all common property resources tend to be overexploited and thus degraded, unless their intensive use is restrained by legal, traditional, or (perhaps) philanthropic institutions.

Negotiations over shared water resources lend themselves to be analysed with concepts derived from game theory. Examples include Rogers (1969) and Dufournaud (1982).

2. Game Theory - some general observations (Chen et al., n.d.)

Rationality and the pursuit of self-interest

According to Bertrand Russell " 'Reason' has a perfectly clear and precise meaning. It signifies the choice of the right means to an end that you wish to achieve". This is the interpretation of 'reason' that most contemporary philosophers favour. However, many philosophers have pointed out situations where the concept of rationality seems to break down. The situations are those who strategic structures resemble that of the Prisoner's Dilemma.

An example of a multiple person Prisoner's Dilemma is as follows:

> Suppose that during a drought, a person must decide whether he should act in his own self-interest and water the garden or whether he should exercise restraint and conserve water. No matter what the other community members do, a person is always better off watering his garden because this is the right means to the end that he desires. The reasoning for this is that it is unnecessary for one person to exercise restraint if most other community members are restraining as well. Even if the rest of the community doesn't exercise restraint, it is futile for just one person to do so since one person does not have that big of an impact on the whole water supply.

The paradox is that if the entire community reasons this way, the water supply will dry up completely but if each community member cooperates and exercises restraint (acts irrationally) the water supply will be spared.

Moral philosopher, Derek Parfit, believes that cooperation, instead of being the irrational choice, can be a rational course of action. Parfit has proposed several solutions to the Prisoner's dilemma so that cooperation becomes the reasonable choice. One solution involves changing the entire structure of the game so that it is no longer a Prisoner's Dilemma. To do this, the payoff functions of each player should be changed in order to make it unprofitable for anyone to defect. In the case of the example given above, the payoff functions of each individual would change if there were a fine for watering the garden during a drought. Such a solution is considered a "political" solution.

Parfit argues that an even better solution would be to find ways to make people cooperate for purely moral reasons. Parfit proposes that the way to achieve such a "moral" solution would be to educate society about the Prisoner's Dilemma and it's most desirable, though irrational solution.

Kant's Categorical Imperative

Immanuel Kant's categorical imperative, which is intended to be a fundamental principle of morality, states:

> "Act only on such a maxim that you also want to become a universal law."

A maxim is just a personal rule of conduct while the universal law is the conduct of all people. Kant's categorical imperative is continually debated among moral philosophers because of its obscurity. Through the use of Game Theory, Kant's views can be clarified. Kant's beliefs, when understood, offers a moral solution to the Prisoner's Dilemma.

One of Kant's examples of categorical imperative is illustrated in the following maxim:

> "Always borrow money when in need and promise to pay it back without any intention of keeping the promise."

This maxim cannot possibly made into a universal law because it cannot be made universal without creating a contradiction. That is, if this maxim was made universal, then everyone would break promises and a promise would have no meaning and therefore promises would cease to exist. Therefore, if this maxim were made universal, a logical contradiction would follow.

In terms of Game Theory, Kant's categorical imperative can be restated as follows:

> "Choose only a strategy which, if it would be chosen by all the players, would yield a better outcome from you point of view than any other".

This statement, then, becomes a solution to the Prisoner's Dilemma. That is, according to Kant's categorical imperative, only a cooperative choice can result. This is because the personal choice of defecting, if made universal, is in contradiction to one's personal interest (similar to the above example).

Hobbes' and Rousseau's Social Contract

Through the use of Game Theory, Hobbes' argument, later made popular by Jean-Jacques Rousseau, for absolute monarchy can be reconstructed. Hobbes argued that, without some form of external constraint on people's behaviours, anarchy would ensue. Cooperation among people would be impossible since people act only to maximize individual welfare and not the welfare of society as a whole. Granted, there will exists altruists (maybe even many of them) who constrain their self-interests for the good of others. However, if even one self-interested person exists, he/she will exploit the altruists' constraints, profiting from both his/her absence of constraint and the altruist's unselfish behaviour.

As a result, Hobbes believes that it is psychologically unnatural for altruists to exist. If just one narrowly self-interested person exists no altruist can survive unless he/she

becomes narrowly self-interested too. In such an environment, known as a State of Nature, Hobbes argues that a person must always be suspicious that another will attack in order to maximize his/her own self-interest. Therefore, in order for a person to maximize his best interest, he must attack the other person before that other person can attack. Each such conflict between two people in a state of nature has been termed as the "Hobbesian Dilemma." However, in the field of Game Theory, the Hobbesian Dilemma has the same structure as a "Prisoner's Dilemma."

Hobbes believed that the "Hobbesian Dilemma" results in a State of Nature because morality is an unstable enforcer of social cooperation. According to Hobbes, a stable enforcer can only exist if not one person can deviate from the established rule by which the rest adhere to. Since cooperation among people is biologically necessary, a stable enforcer must exist. Hobbes believes that the best form of social enforcement is the existence of an all-powerful sovereign.

Biology

Although the natural world is often thought of as brutal, dog-eat-dog type, cooperation exists between many different species. The reason behind this coexistence can be modelled using game theory. For example, birds called ziczacs enter crocodiles' mouths to eat parasites. This symbiosis allows crocodiles to achieve good oral hygiene and allows the ziczacs to get a decent meal. But any crocodile can easily eat a ziczac (defect). So why don't they? Apparently, over the eons of evolutionary action, the crocodiles and the ziczacs have learned the benefits of cooperation, the "equilibrium point."

Of course, chances are that neither the crocodiles nor the ziczacs rationalize their behaviour with game theory. But their behaviour can still be modelled using game theory principles.

Economics

Many of the interactions in the business world may be modelled using game theory methodology. A famous example is that of the similarity of the price-setting of oligopolies to the Prisoner's Dilemma. If an oligopoly situation exists, the companies are able to set prices if they choose to cooperate with each other. If they cooperate, both are able to set higher prices, leading to higher profits. However, if one company decides to defect by lowering its price, it will get higher sales, and, consequently, bigger profits than its competitor(s), who will receive lower profits. If both companies decide to defect, i.e. lower prices, a price war will ensue, in which case neither company will profit, since it will retain its market share and experience lower revenues at the same time.

3. The importance of cooperation (McCain, n.d.)

There is, in general, no unique answer to the question "what is the rational choice of strategies?" Instead there are at least two possible answers, two possible kinds of "rational" strategies, in non-constant sum games. Often there are more than two "rational solutions," based on different definitions of a "rational solution" to the game. But there are at least two:

- a "non-cooperative" solution in which each person maximizes his or her own rewards regardless of the results for others, and
- a "cooperative" solution in which the strategies of the participants are coordinated so as to attain the best result for the whole group.

Of course, "best for the whole group" is a tricky concept -- that's one reason why there can be more than two solutions, corresponding to more than one concept of "best for the whole group."

Without going into technical details, here is the problem: if people can arrive at a cooperative solution, any non-constant sum game can in principle be converted to a win-win game. How, then, can a non-cooperative outcome of a non-constant sum game be rational?

The obvious answer seems to be that it cannot be rational: as Anatole Rapoport argued years ago, the cooperative solution is the only truly rational outcome in a non-constant sum game. Yet we do seem to observe non-cooperative interactions every day, and the "noncooperative solutions" to non-constant sum games often seem to be descriptive of real outcomes. Arms races, street congestion, environmental pollution, the overexploitation of fisheries, inflation, and many other social problems seem to be accurately described by the "noncooperative solutions" of rather simple non-constant sum games. How can all this irrationality exist in a world of absolutely rational decision makers?

Credible Commitment

There is a neoclassical answer to that question. The answer has been made explicit mostly in the context of inflation. According to the neoclassical theory, inflation happens when the central bank increases the quantity of money in circulation too fast. Then, the solution to inflation is to slow down or stop increasing in the quantity of money. If the central bank were committed to stopping inflation, and businessmen in general knew that the central bank were committed, then (according to neoclassical economics) inflation could be stopped quickly and without disruption. But, in a political world, it is difficult for a central bank to make this commitment, and businessmen know this. Thus the businessmen have to be convinced that the central bank really is committed -- and that may require a long period of unemployment, sky-high interest rates, recession and business failures. Therefore, the cost of eliminating inflation can be very high -- which makes it all the more difficult for the central bank to make the commitment. The difficulty is that the central bank cannot make a credible commitment to a low-inflation strategy.

Evidently (as seen by neoclassical economics) the interaction between the central bank and businessmen is a non-constant sum game, and recessions are a result of a "noncooperative solution to the game."

This can be extended to non-constant sum games in general: noncooperative solutions occur when participants in the game cannot make credible commitments to cooperative strategies. Evidently this is a very common difficulty in many human interactions.
Games in which the participants cannot make commitments to coordinate their strategies are "noncooperative games." The solution to a "noncooperative game" is a "noncooperative solution." In a noncooperative game, the rational person's problem is to answer the question:

> "What is the rational choice of a strategy when other players will try to choose their best responses to my strategy?"

Conversely, games in which the participants can make commitments to coordinate their strategies are "cooperative games", and the solution to a "cooperative game" is a "cooperative solution." In a cooperative game, the rational person's problem is to answer the question,

> "What strategy choice will lead to the best outcome for all of us in this game?"

If that seems excessively idealistic, we should keep in mind that cooperative games typically allow for "side payments," that is, bribes and quid pro quo arrangements so that every one is (might be?) better off. Thus the rational person's problem in the cooperative game is actually a little more complicated than that. The rational person must ask not only "What strategy choice will lead to the best outcome for all of us in this game?" but also

> "How large a bribe may I reasonably expect for choosing it?"

4. Game theory and its relevance for shared river basins

A hypothetic example of the imaginary Mvula river basin

Consider a non-existent river basin called MVULA shared by two countries. One country (UP) is situated upstream of the other, downstream, country (DOWN). Given that water flows downhill, water use in DOWN does not affect water availability in UP, but consumptive water use in UP does diminish water availability in DOWN.

Starting situation

Consider the starting situation. Both countries are not very developed, and both derive some benefits from utilising the water resources of this basin, including the important services that the riverine ecosystems produce. Let us assume that in this starting

situation the countries derive the following net benefits from their uses of the basin's water resources (this we will call primary benefits):

Primary benefits

UP	20 M/a
DOWN	40 M/a

DOWN derives more benefits from the river's resources because it has more water (thanks to water generated in UP that flows into DOWN), and richer water-based ecosystems, especially Mvula's estuary, that produce important goods such as fisheries, mangroves etc.

Development options

Both countries now want to develop economically and further utilise the water resources of the basin. Each country has three development options:

1. No development
2. Medium development
3. Full development.

The full development option means that all the water available in either UP or DOWN is consumptively used. Medium means that half of all water resources available in both countries are consumptively used. No development means that the starting situation is maintained. It is further assumed that medium development is the maximum allowable development level so as not to harm the primary benefits derived from the river; whereas the full development scenario reduces those primary benefits to nil.

The potential direct economic benefits (i.e. assuming that sufficient water is available) of the medium and full development scenarios are for both countries identical.

Potential direct economic benefits from development scenarios

NO	0 M/a
MEDIUM	50 M/a
FULL	100 M/a

Resulting benefits for UP

The total benefits that result for the various development scenarios are clear for country UP, since its water availability does not depend on what country DOWN will choose to do. UP will derive its highest benefit when choosing the full development scenario.

Total benefits for UP

development scenario	primary benefits	development benefits	total benefits
1. NO	20	0	20
2. MEDIUM	20	50	70
3. FULL	0	100	100

Resulting benefits for DOWN

The benefits for DOWN depend on which development scenario UP chooses. IF UP decides not to develop, sufficient water is available for DOWN's medium development plan, and some water stress for primary benefits would occur for the full development scenario.

Total benefits for DOWN if UP chooses NO development

development scenario	primary benefits	development benefits	total benefits
1. NO	40	0	40
2. MEDIUM	40	50	90
3. FULL	10	100	110

If UP chooses full development, however, no water generated in UP will reach DOWN. DOWN will have to make do with the relatively small amounts of internally generated water resources, hampering its development.

Total benefits for DOWN if UP chooses FULL development

development scenario	primary benefits	development benefits	total benefits
1. NO	20	0	20
2. MEDIUM	10	20	30
3. FULL	0	30	30

If UP chooses its medium development scenario, water sufficient to sustain the ecosystem in DOWN is released from UP; but any additional water use by DOWN would affect primary benefits.

Total benefits for DOWN if UP chooses MEDIUM development

development scenario	primary benefits	development benefits	total benefits
1. NO	40	0	40
2. MEDIUM	20	50	70
3. FULL	5	75	80

Comparing outcomes

The above results can be summarised in a so-called pay-off table as follows:

		DOWN		
		NO dev.	MEDIUM dev.	FULL dev.
UP	NO dev.	20 , 40	20 , 90	20 , 110
	MEDIUM dev.	70 , 40	70 , 70	70 , 80
	FULL dev.	100 , 20	100 , 30	100 , 30

(NB: The first figure in each cell gives the total benefits for UP, the second that for DOWN)

The highest total benefits that can be derived from the Mvula water resources amounts to 150 M/a (70 + 80), namely when UP chooses the Medium development scenario, and DOWN the Full development scenario. Any other combination of scenarios yields less total benefits.

Nevertheless, for UP it is always better to choose the full development scenario.

So it is most likely that UP chooses the full development option; severely restricting the development options for DOWN: for DOWN the added benefit of choosing either the Medium or Full development scenarios is relatively small compared to no further developments (only 10 M/a additional benefit).

As a result, a sub-optimal outcome is foreseen, with a highly inequitable water utilisation in favour of UP, while the total benefits only amount to 130 M/a.

Compensation through side-payments

The observed asymmetrical outcome could, in principle, be solved by means of compensation through side payments. Two theoretical possibilities exist:

(a) UP compensates DOWN, namely for the impact caused by implementing its full development scenario;

(b) DOWN compensates UP, namely for UP settling for the medium development scenario.

UP compensates DOWN

UP could compensate DOWN if it implements the full development scenario, because this would impact directly on water availability and thus restrict DOWN's development options. The financial impact on DOWN is clear: at least 40 M/a (70-30) and at most 50 M/a (80-30). It could thus be considered reasonable that UP compensates DOWN with an amount of 40 M/a. The resulting benefits appear quite equitable.

The problem, however, is that UP may not be a signatory to a convention that compels it to compensate for transboundary impacts. UP may simply consider the

water available from the Mvula basin inside its territory as its own property ("territorial sovereignty").

Benefits if UP goes for Full Development, and compensates DOWN with 40 M/a

development scenario	primary benefits	development benefits	side payment	total benefits
UP - full	0	100	-40	60
DOWN - medium	10	20	+40	70

DOWN compensates UP

If DOWN had sufficient financial resources, it would offer UP a payment for foregoing the FULL development option and settle for Medium development. It would have to pay at least 30 M/a (100-70) to satisfy UP, which DOWN may be willing to pay, since its added benefit would be at least 40 M/a (70-30) and at most 50 M/a (80-30).

Yet the total benefits to UP (100) are now twice as big as that for DOWN (50). It is doubtful whether DOWN would find this a fair deal, even if it is for DOWN the most rational choice to make.

Benefits if UP settles for Medium Development, with 30 M/a compensation from DOWN

development scenario	primary benefits	development benefits	side payment	total benefits
UP - medium	20	50	+30	100
DOWN - full	5	75	-30	50

The most equitable outcome

The UN Convention (UN, 1997) and the SADC Protocol (SADC, 1995, under revision, see SADC,2000) state that each country sharing an international river:
(a) should utilise it in an equitable and reasonable manner; and
(b) prevent the causing of significant harm to other countries.

Applying these rules to the Mvula example, the situation whereby both UP and DOWN choose the medium development option adheres closest to the letter and spirit of the UN Convention and SADC Protocol: transboundary impact would be minimised, while allowing both countries a reasonable and equitable share of Mvula's water resources. Both countries would derive comparable benefits (70 M/a each).

Benefits if both countries settle for Medium Development

development scenario	primary benefits	development benefits	total benefits
UP - medium	20	50	70
DOWN - medium	20	50	70

In this reading, neither of the two countries could claim compensation for settling for the medium development option, as it is their duty.

If, however, one country would defect and proceed with full development, a new situation would result which would conflict with the international rule, and the issue of compensation could become an object of negotiation.

Defecting would, in fact, be tempting for both countries. UP would gain 30 M/a if it proceeded with full development. If DOWN would unilaterally proceed with full development, it could gain 10 M/a of additional benefits.

Conclusion

Game theory indicates that countries will attempt to achieve the highest benefits in negotiating shared water resources. International rules have put limits to the manner in which countries may utilise the international water resources occurring within their territories.

Because of the asymmetrical situation in river basins, whereby downstream uses do not impact upstream users but upstream users do cause downstream impacts, the reasonable and equitable allocation of water without causing significant harm, as prescribed by the UN Convention and the SADC Protocol, will always imply that upstream countries will forego some of the potential water benefits.

A key question is whether upstream countries will indeed accept this without demanding compensation. A related question is whether countries can be forced to compensate other countries if their water uses can be proven to be unreasonable, inequitable and to cause significant impact to them.

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B 2.5

SADC and international waters

Code	B 2.5
Teaching topic	SADC and international waters
Time (hrs)	2
Content/Skill focus	SADC structure, SADC water issues and SADC Protocol
Objectives	1.To introduce SADC structure in water issues 2. To introduce key principles of SADC Protocol on Shared Watercourses 3. To analyse the reasons of its revision 4. To compare the revised Protocol on Shared watercourses in SADC with UN Convention on International watercourses and SADC Protocol on shared watercourse systems
Learning methodology	- Discuss selected provisional of the three legal instruments towards their practical implications - Refer to ratification of Convention and Protocol and institutional, political or legal measures of implementing
Trainer/facilitator guide	
Course book	P. Jose & P. van der Zaag: Legal aspects of shared waters in SADC
Course reader	Revised SADC Protocol on Shared Watercourses of 2000
Further reading	Shela, O., 2000, Management of shared river basins: the case of the Zambezi River. *Water Policy* 2(1-2): 65-81 Carmo Vaz, Á., & A. Lopes Pereira, 2000, The Incomati and Limpopo international river basins; a view from downstream. *Water Policy* 2(1-2): 99-112 Conley, A.H., & P.H. van Niekerk, 2000, Sustainable management of international waters: the Orange river case. *Water Policy* 2(1-2): 131-149 SADC Protocol on Shared Watercourse Systems of 1995

Legal aspects of shared waters in SADC

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1 Introduction

Important international rivers in the SADC region are the Incomati (South Africa, Swaziland, Mozambique), Limpopo (Botswana, South Africa, Zimbabwe, Mozambique), Okavango (Angola, Namibia, Zimbabwe, Botswana), Orange (Lesotho, South Africa, Botswana, Namibia), and the Zambezi (Angola, Zambia, Namibia, Botswana, Zimbabwe, Tanzania, Malawi, Mozambique) (Figure 1, Box 1). Even the upper reaches of the river Nile extend into SADC territory, and also the mighty Congo may be included in this list.

It is worth noting that all waters in Zimbabwe are in fact international waters, since any water generated within Zimbabwe territory may, by natural means, end up in territory of another country, while Zimbabwe's other waters are received from upstream neighbours.

Many SADC countries are rapidly approaching situations of water stress (generally defined as less than 1,700 m^3 per capita per year), if not absolute water scarcity (less than 1,000 m^3 per capita per year). The per capita water availability in the SADC region, which is already low, is expected to reduce by half by the year 2025, which is mainly a result of population growth. Given the scarcity of water in Southern Africa, the sharing of water resources between countries, and between sectors, is often a *zero sum* problem: its use by one country or sector implies another country or sector is deprived.

The last few years have seen a remarkable convergence throughout the world concerning the central role given to the river basin as the management unit of international waters. For the SADC, this is exemplified by the signing, in 1995, of the 'Protocol on Shared Watercourse Systems', which came into force in September 1998. (The revised 'Protocol on Shared Watercourses in the SADC Region' was signed by all Head of State of SADC except the DRC in August 2000. The new Protocol will come into force, and replace the earlier Protocol, once two thirds of SADC member states have ratified it.)

There is an increasing awareness in the SADC region that appropriate measures need to be taken, and that the sound management of international watersheds will prove crucial. Seen in this light, the general absence of open conflicts about water is a remarkable fact and should be appreciated. We seem to understand that, as much as water may divide groups of people and pit countries against each other, water as the most basic human

need appears to mobilise countries in the region toward common thinking, and a common agenda.

This common thinking is already materialised in the existence of some agreements between riparian countries about water resources, regional treaties, and river basin organisations. One of the essential functions of these international arrangements is reconciling and harmonising the interests of riparian countries. The main thrust of the management of shared river basins is thus to find ways of turning potential conflicts into constructive cooperation, and to turn what is often perceived as a zero-sum predicament - in which one party's gain is another's loss - into a win-win proposition. Finding such propositions is, however, difficult since water is scarce in SADC.

Figure 1: Large international river basins in Africa

(source: Transboundary Freshwater Dispute Database;
URL http://terra.geo.orst.edu/users/tfdd/register/images/africa.gif)

Box 1: Characteristics of some important international SADC rivers (indicative figures)

Incomati

catchment area: 47 Gm^2; yield: 3.6 Gm^3/annum; population: 2.3 M

riparian countries	%	S. Africa	Swaziland	Mozambique
	area	61	6	33
	yield	82	13	5

Limpopo

catchment area: 413 Gm^2; yield: 7.3 Gm^3/annum; population: 14 M

riparian countries	%	Botswana	S. Africa	Zimbabwe	Mozambique
	area	21	44	15	19
	yield	6	66	16	12

Okavango

catchment area: 586 Gm^2; yield: 11.7 Gm^3/annum; population: 1? M

riparian countries	%	Angola	Namibia	Zimbabwe	Botswana
	area	28	30	3	39
	yield	93	3	0	4

Orange

catchment area: 973 Gm^2; yield: 11 Gm^3/annum; population: 13 M

riparian countries	%	Lesotho	S. Africa	Botswana	Namibia
	area	3	59	11	27
	yield	40	56	0	4

Zambezi

catchment area: 1,300 Gm^2; yield: 113 Gm^3/annum; population: 28 M

%	Angola	Zambia	Namibia	Botswana	Zimbabwe	Tanzania	Malawi	Mozambique
area	18	40	1	2	15	7	7	10
yield	18	47	-1	-5	15	5	15	5

2 Towards the SADC Protocol

The Zambezi River Action Plan (ZACPLAN) was formally adopted in 1987. One of the projects under this plan was ZACPRO 2, "the development of regional legislation necessary for the management of the Zambezi and minimum national legislation required by riparian States for enforcement." Out of this project grew, in a sometimes tortuous process, the Protocol on Shared Watercourse Systems in the SADC Region, originally planned for acceptance at the 1993 SADC summit, but not agreed upon until 1995 (Ohlsson, 1995). During the 1995 summit, 10 of the 11 heads of state signed the Protocol.[8] Angola did not sign (absent?).

One explanation why this initially basin-specific initiative was adopted SADC-wide, is the regional drought of 1992. This devastating drought impressed upon all SADC member states the need for a regional arrangement with respect to watercourses.

[8] The 1992 Treaty establishing the Southern African Development Community defines "Protocol" as an instrument of implementation of the Treaty, having the same legal force as the Treaty.

The SADC Water Sector Coordination Unit became operational in 1996. One of its immediate tasks was to get the Protocol ratified by the member states, since the Protocol would only enter into force after two-thirds of the members had ratified it. Most SADC states indeed ratified the Protocol, and it came into force in September 1998. However, Mozambique was the only country refusing to ratify it.

Mozambique's refusal was because it wanted the definition of two crucial concepts used in the Protocol, namely "drainage basin" and "watercourse system", to be clarified. More precisely, it wanted both concepts to explicitly state that the downstream boundary of both concepts is the sea, and only in exceptional cases a desert or a lake (as is the case with the Okavango). Carmo Vaz and Pereira (2000: 101-102) formulated the point thus:

> "This definition of basin boundaries is not always accepted as such and creates additional difficulties in studies, proposals and negotiation for the sharing and common use of water resources. There is a certain tendency among the countries that are located along the upstream reaches of an international river basin to treat the basins of the tributaries as not being part of the basin. In this perspective, for example, the water developments in the Kafue basin would be a matter of planning and decision solely for Zambia, although it is a sub-basin of the Zambezi river basin. Mozambique has always considered this position to be unacceptable and it is one of the reasons why the Government of Mozambique asked for modifications of the SADC Protocol on Shared River Basins."

It is clear that the concerns of Mozambique were, among others, informed by its experience in the Incomati, where South Africa and Swaziland were signing treaties on the Komati Basin without involving Mozambique.

Mozambique's concerns could have been ignored by the other SADC members, since many countries were of the opinion that Mozambique was complicating things unnecessarily. However, an interesting twist of events was triggered when the United Nations adopted in May 1997 the "Convention on the Law of the Non-navigational Uses of International Watercourses". Key concepts used in the SADC Protocol (drainage basin, watercourse system) were inconsistent with the new concept of watercourse used by the UN Convention, while it did not refer to drainage basin. And yet, seven (Angola, Botswana, Malawi, Mozambique, Namibia, South Africa and Zambia) of the then 11 SADC member states had voted in favour of the UN convention, one abstained (Tanzania), while three (Lesotho, Swaziland and Zimbabwe) apparently were absent.

Given this situation, SADC could do little else then decide to revise the Protocol, so as to make it consistent with the UN Convention. This would make the Protocol obviously acceptable to Mozambique, as it had signed the UN Convention. The revision of the Protocol took 3 years (from 1998-2000).

Revising the Protocol

There were for main reasons for revising the protocol:

1. It lacked clarity on key concepts of the protocol namely "drainage basin" and "watercourse system" and their implications for downstream countries.
2. It lacked consistency with UN Convention on the Law of the Non-Navigational uses of International Watercourse adopted two years later (May 1997) in key concepts and provisions; notable are the inconsistent concept of watercourse system and drainage basin, as well as the lack of the obligation not to cause significant harm in the original Protocol
3. It lacked specific provisions related to environmental protection
4. It lacked specific provisions related to the need of existing shared watercourse agreements with the Protocol.

The Revised Protocol is clearly inspired by the UN Convention and formulated more precisely key concepts and specific provisions. This is exemplified by the following:

1. Watercourse –art 2.a) of the Convention and art.1 of the Revised Protocol
2. Art. 3 of the UN Convention assumed and "regionalized" in art .6 of the Revised Protocol
3. UN Convention principles – equitable and reasonable utilisation and participation was assumed and developed in art. 3 of the Revised Protocol while art.6 of the UN Convention was transcript into art.3.8.a) b).
4. Provisions of the UN Convention related to significant harm, exchange of data and information, planned measures and protection, preservation and management, were included in Revised Protocol as Specific provisions in art.4

The revision of the Protocol took 3 years (from 1998-2000), and was signed by 13 of the now 14 member states in Windhoek in August 2000. The Democratic Republic of Congo was the only country not to sign (absent?).

By September 2002, eight SADC countries had ratified the revised Protocol (Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa and Swaziland). Once nine countries (two-thirds) have ratified it, it will enter into force and replace the 1995 Protocol.

The Protocol on Shared Watercourses in the SADC Region

The new Protocol has a total of 16 articles following a preamble where reference is specifically made to the Helsinki Rules and to the UN Convention on the Law of Non-Navigational Uses of International Watercourses.

The overall objective of this Protocol is to foster closer co-operation for judicious, sustainable and co-ordinated management, protection and utilisation of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation. The article refers to the promotion of shared watercourse agreements and management institutions; sustainable, equitable and reasonable utilisation of the shared watercourses; co-ordinated and integrated environmentally sound development and management of shared watercourses; harmonisation and monitoring of legislation and

policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management.

The following general principles apply:

- unity and coherence of each shared watercourse, consistent with the sustainable development of all Watercourse States and observing the objectives of regional integration and harmonisation of their socio-economic policies and plans;
- utilisation of shared watercourses open to each Watercourse State, in accordance with the principles contained in the Protocol;
- utilisation by each State, within its own territory, of a shared watercourse in an equitable and reasonable manner, taking into account all relevant factors and circumstances;
- in utilising a shared watercourse in their territories, each State will take all appropriate measures to prevent the causing of significant harm to other Watercourse States;
- respect of the existing rules of customary or general international law relating to the utilisation and management of the resources of shared watercourses;
- maintenance of a proper balance between resource development and conservation of the environment to promote sustainable development;
- close co-operation with regard to the study and execution of all projects likely to impact on the regime of the shared watercourse;
- exchange of available information and data regarding the hydrological, hydrogeological, water quality, meteorological and environmental condition of shared watercourses.

The Protocol includes Specific Provisions that cover the following aspects: Planned Measures, Environmental Protection and Preservation, Management of Shared Watercourses, Prevention and Mitigation of Harmful Conditions, Emergency Situations.

The Protocol includes articles on Shared Watercourse Agreements (following closely the UN Convention) and Settlement of Disputes, establishing that the State Parties shall try to resolve their disputes amicably and in accordance with the principles enshrined in the SADC Treaty or, when disputes cannot be solved in this way, referring them to the SADC Tribunal for decision.

3 Implementing the SADC Protocol

SADC water issues are object of specific provisions in the Treaty of SADC (1992) and the Revised Protocol on Shared watercourses (2001) which established a legal regime and institutional framework to promote co-operation in water sharing processes among SADC members States.

It is important to sketch how the highest and intermediary organs of SADC participate in water issues and how far watercourse institutions are linked with the SADC structure,

i.e. how the management activities of different watercourses among watercourse States corresponds to the SADC objectives and the structures it has established to pursue these.

The relevant institutions through which SADC water issues pass are: the Summit (art.9 &10 of the SADC Treaty) and the Council of Ministers (art.11). The Council of Ministers receives from the SADC Committee of Water Ministers all technical reports to be discussed by the Summit (art. 5 of the Revised Protocol.

The SADC Committee of Water Ministers, in turn, is advised by the Committee of Water Senior Officials; Water Sector Co-ordinating Unit; the Water Resources Technical Committee and its sub-Committees).

In addition, Shared Watercourse Institutions (watercourse commissions, water authorities or boards, established by the Watercourse States), are intended to implement the provisions of the Protocol on the ground.

The Revised Protocol on Shared Watercourses in SADC looks as the ”regionalized” UN convention on the Law of the Non-navigational Uses of International Watercourses. Through the Protocol SADC countries are intended to promote water security applying its provisions in a regional profitable manner. They expressed their political will on implementing and complying with the provisions of the UN Convention, and to develop an institutional framework that will be conducive for implementing them. Watercourses management institutions will be established that will monitor, and regulate the sharing of water, and will address issues related to water allocation, water quality, infrastructures development, measures of compliance etc.

4 References

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B 2.6

Implementing conventions and protocols

Code	B 2.6
Teaching topic	Implementing conventions and protocols
Time (hrs)	2
Content/Skill focus	Mechanism of implementing nationally the regional/ international conventions/ Protocols
Objectives	To discuss institutional, political and legal measures of implementing International Law
Learning methodology	Refer to ratification of Conventions and Protocols and measures of Compliance
Trainer/facilitator guide	
Course book	P. Jose: Mechanism of implementing nationally the regional/international conventions/protocols
Course reader	Ashton, P., 2000, Southern African water conflicts: are they inevitable or preventable? In: Green Cross International,. 2000, *Water for peace in the Middle East and Southern Africa.* Green Cross International, Geneva; pp.94-98
Further reading	Alexander, W.J.R., Science, history and the Kasikili Island dispute. *South African Journal of Science* Aug 1999, Vol. 95 Issue 8 Nakayama, M., 1998, Politics behind Zambezi Action Plan. *Water Policy* 1(1): 397-409

Mechanism of implementing nationally the regional/international conventions/protocols

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The implementation of international law by States is done through the concept of ratification or other procedures similar to it, which introduces this field of law in national legal system for purposes of compliance in daily regulatory activity of the States Organs or institutions.

Ratification is a constitutional procedure through which States express their approval and consent to be bound by and implement in their territories the rules of International Law either universal either regional even bi or (tri) lateral. It means that, from the time one State ratifies an International Convention, the rules contained in that Convention are legal binding the State and applicable in the country for the purposes they were adopted. For that, it requires the further analysis of existing national legislation and policies in light of rules of International Law.

Therefore, there is a need of consistency and conformity of national legislation and policies to the existing International Law. In case of inconsistency (contradicting national rules, legal vacuum etc.), national authorities have to approve new legislation complying International Law, creating a new legal framework.

For the purposes of implementation of International Law internally, ratification or other procedure depending on whether the State took part on negotiation and signed the Convention or not, the International Conventions and Regional Protocols will arise the same consequences: it became binding to the State.

In light of clarity of the implementation of international Conventions and Regional Protocols and possible bi (tri) lateral agreements[9] is relevant to set a hierarchy of rules of International Law to which all of them belong. In the top position of hierarchy there is the international (universal) rule governing relations among the States of the entire international community, even while these States may differ economically, politically, culturally, and in their technical and technological capacities.

However, at regional level, the trend is to ensure that States can agree on more specific regimes that guide their relations, which may not be applicable to others. The rules comprising regional regimes touch all aspects of co-operation among States of the region which may not be common to other region, due, for instance, to regional particularities (resource endowment, culture, infrastructure development, political, integration process, regional commitments and arrangements etc).

[9] The concepts of Convention, Protocol and agreement are legal equal in light of the Vienna Convention On Law of The Treaties, 1969- art.2.1(a)

More specific are bi (tri) lateral agreements. In case of shared watercourse, States have to agree on the way of applying the principles of International Conventions and regional Protocols. In applying the principle of reasonable and equity utilisation of watercourses, they have to resolve the problem of infrastructure construction in the watercourse; the criteria to be used for allocating water to different uses in different period of the year; water quality standards for downstream States; data exchange; criteria to establish when a harm is considered significant; institutional framework for monitoring the compliance of such agreements; early warning mechanisms for droughts and floods; and finally compensation issues.[10]

Finally, implementing nationally the International Conventions and Regional Protocols is to create, adapt and develop a bi (tri) lateral and national legal, institutional and policy framework that complies with the international obligations so that Watercourse states "think and acts systematically and consistently as far as the legal assessment of water entitlement from an international watercourse is concerned".[11]

In order to ensure conformity, consistency and compliance with international, regional and bi (tri) lateral agreements, the revision of national laws and policies is required. Such a conformity will then form the basis for the development of national water demand and conservation programmes and strategies for different uses.

The question may arise whether an international Convention or a regional Protocol that is not yet in force should be respected. If an agreement is not in force, there is no requirement to implement it. However, there is a basic obligation of those States that have signed an international treaty, to behave in such a way so as not to frustrate the object of that treaty. Before it enters in force, signatories have an obligation to abstain from any measure contrary to the signed convention.[12] In International Law this is assumed as an obligation of good faith.

[10] In this regard, the Tripartite Interim Agreement Between Mozambique, South Africa and Swaziland (August 2002) establishes in Art. 4 the rule of utilization of the Incomati Watercourse trying to implement the SADC Principles for water sharing

[11] Fadia Daibes in Legal assessment model 2002.

[12] For a better understating, see Art. 18 of the Vienna Convention on the Law of the Treaties.

B 2.7

Institutional and critical perspectives on shared rivers

Code	B 2.7
Teaching topic	Institutional and critical perspectives on shared rivers
Time (hrs)	2
Content/Skill focus	Institutional and critical perspectives on shared rivers
Objectives	1.To analyse river basin management institutions and the process of their creation 2. To provide an overview the regional action plan on integrated water resources development and management
Learning methodology	Elicit understanding of multilateral and unilateral measures beyond the Convention and Protocols
Trainer/facilitator guide	
Course book	P. Jose: Institutional and critical perspectives on shared rivers
Course reader	
Further reading	

Institutional and critical perspectives on Shared Rivers

Patricio Jose, Instituto Superior de Relações Internacionais ISRI

1. The need for watercourse institutions

From the middles of nineties, the Southern Africa region is seriously engaged in a responsible process of rules adoption for governance of their mutual relations in the field of water issues. Water scarcity in the face of increasing water demand, requires consistent and flexible institutional framework resulting from the agreements reached to undertake major efforts to meet SADC objectives as a whole and the interests of particular countries in context of regional integration.

In this regard, the institutions established by the SADC Treaty and the SADC Protocol are not sufficient to implement truly water sharing arrangements in international watercourses. Riparian States have to create Watercourse institutions and empower them adequately.

Institutional frameworks for the management of certain watercourses, and for implementing agreements, are still lacking. Water sharing arrangements that are based on the principle of equitable and reasonable utilisation principle will require the question of Trans-boundary water economics to be addressed. This will require, in turn, consultations at different levels with experts, politicians and the water users themselves. Watercourse institutions would be well-placed to facilitate such consultations.

Due to the technical complexity of implementing the principles of the UN Convention and the Revised SADC Protocol, a trans-boundary water policy is needed for the establishment of permanent watercourse management institutions. Such institutions would have to ensure that reasonable and equitable utilisation indeed leads to reasonable and equitable shares of water for riparian States. Ensuring the equal rights of downstream and economic weak countries of the watercourse is particularly important, as well as the promotion of joint studies, and programmes and projects

Another challenge is found at the national level. National policy and legal reforms should establish programmes of water demand and water conservation that aim to reduce the level of unused water, curb excessive water consumption on private properties, and promote the re-use of waste water.

Furthermore, the exploitation of existing water infrastructure in upstream riparian countries has to be consistent with downstream needs in terms of water quantity and quality. Lastly, it is important to state that the existing mechanism of co-operation reinforces the need for further integration in the Southern Africa region.

2. Implementability of International Water Law

The historically developed Principles and Rules governing the sharing of international watercourses are useful attempts to ensure that all watercourse States can benefit from the water resources that a watercourse provides. However, the different circumstances under which the principles are to be implemented, need not lead to "reasonable and equitable results".

A first constraint is the eternal problem of upstream and downstream watercourse States, which make some naturally dependent on others. Aside of that, watercourse States may have different levels of development, which make some more vulnerable than others.

In fact, it is a still unresolved issue in how far conventional criteria of equitable and reasonable utilisation, once applied, contribute to meet the results expected by watercourse States, particularly those downstream and those least developed. In this regard, there are possibly discrepancies in the application of the principle of reasonable and equitable utilisation, due to the different circumstances under which this principle is applied. These circumstances include existing water infrastructure, existing uses of water, water demand trends both upstream and downstream, and the different levels of water scarcity in the various riparian countries.

The challenge is: what answers do Water Conventions, Protocols and other agreements give if existing uses in the watercourse are not equitable and not reasonable?

A second question is: can reasonable and equitable utilisation cause significant harm? If so, how to resolve the emerging conflict of rights.

A third question is: what role can compensation play as a correction measure in case significant harm does occur.

Assuming that the Provisions of the International Conventions, Regional Protocols and other watercourse agreements can only meet the expected results if applied with the necessary complementarity and adjustments, it is obvious that the co-operation principle is a subsidiary one intended to get the watercourse States together and negotiate the reasonable and equitable utilisation of the shared watercourse, avoiding discrepancies which may get them into conflict.

Similarly, existing uses and existing water works that have impacts in terms of water quantity and water quality, may frustrate the expectations of some watercourse States. Such issues should be subject of negotiations and may require new "adjusting" agreements so that they do not unduly affect sharing arrangements in watercourses.

Relative to the potential conflicts arising from reasonable and equitable utilisation (upstream) and possible significant harm (downstream), two closely connected parameters have to be analysed. These are:

1. The source of the harm (whether in terms of water quantity – misallocation - or water quality – pollution). Whatever act taken by the State causing the significant harm, should be assessed on the basis of relevant existing legal instruments;

2. Credibility of data and information exchanged for determining the reasonable and equitable utilisation by each of the watercourse States. Since data inform rightful proportions of water in a sharing agreement, these data must be as much as possible true and trusted, i.e. not deliberately manipulated.

Compensation provisions are not very well developed in international water law. In the UN Convention compensation appears in such a way that it has to be discussed "where appropriate", but after consultation with the affected State, in order to eliminate or mitigate such harm. A careful reading seems to imply that compensation of significant harm is not a compulsory enforceable right of affected Watercourse State.

3. Monitoring compliance of International Water Law

To meet specific conventional or customary obligations requires not only political will, but also effective State capacity. To comply with international obligations may require capacities that certain countries may lack.

Many sources of International Water Law lack compliance procedures to ensure the implementation of the provisions.[13] At regional level this is crucial if successful implementation is expected. In this regard, it has been proposed to establish a "Geneva Strategy and Framework for Monitoring Compliance with International Watercourse Agreements",[14] which includes a compliance review procedure.

[13] For example art. 4 of the Convention on the Protection and Use of Trans-boundary Watercourses and International lakes refers to the establishment of programmes for monitoring the conditions of the trans-boundary waters but it doesn't establish itself

[14] Final Report prepared by Dr Patricia Wouters, Director, WATER Law and Policy Programme, University of Dundee, Scotland.

B 2.8

Personal lessons by senior negotiators

Code	B 2.8
Teaching topic	Personal lessons by senior negotiators
Time (hrs)	3
Content/Skill focus	Personal lessons by skilled negotiators
Objectives	1.To learn from practical experience. 2. To instil confidence through exposure to role-models.
Learning methodology	Presentation of case study by resource person. Facilitated discussions.
Trainer/facilitator guide	Resource person shares experiences and lessons. Facilitated interaction with group.
Course book	
Course reader	
Further reading	

Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 3

Conflict

Table of contents

B 3.1

Understanding conflict

Code	B 3.1
Teaching topic	Understanding conflict / theories on conflict
Time (hrs)	2
Content/Skill focus	Understanding conflict: Theories on conflict Personal response to conflict
Objectives	1.To understand the psychological, sociological and political functions of conflict. 2. To appreciate the positive value of conflict and its destructive potential. 3. To enhance self-understanding in the face of conflict.
Learning methodology	'Conflict spectrum' exercise Reflection on personal experience of conflicts: small group work Academic input on theories of conflict Reference to key academic texts
Trainer/facilitator guide	Implement 'conflict spectrum' exercise. Clarify key concepts: conflict, peace, conflict management, mediation, reconciliation. Outline key theories.
Course book	"Conflict", CCR Manual pp. 4-7
Course reader	Ronald J. Fisher "Intergroup conflict"
Further reading	

Source: Centre for Conflict Resolution, 2001, "Skills Development Training for Conflict Transformation" Conflict Resolution Manual. United Nations Department for Economic and Social Affairs, New York; pp. 4-7

CONFLICT

NATURE OF CONFLICT

Conflict is a natural and necessary part of our lives

Whether at home with our families, at work with colleagues or in negotiations between governments, conflict pervades our relationships. The paradox of conflict is that it is both the force that can tear relationships apart and the force that binds them together. This dual nature of conflict makes it an important concept to study and understand.

Conflict is an inevitable and necessary feature of domestic and international relations. The challenge facing governments is not the elimination of conflict, but rather, how to effectively address conflict when it arises. While most government officials in Africa are not frequently confronted by large-scale violence or humanitarian crises, they are often involved in lesser but nevertheless serious conflicts over trade, refugees, borders, water, defence, etc. Their government may be party to the conflict or called on to serve as mediator. In either case, they require particular skills and techniques to tackle the issues in a constructive fashion. Conflict can be managed negatively through avoidance at one extreme and the use or threat of force at the other. Alternatively, conflict can be managed positively through negotiation, joint problem-solving and consensus-building. These options help build and sustain constructive bilateral and multi-lateral relations.

Good conflict management is both a science and an art

We have all learned responses to confrontation, threats, anger and unfair treatment. Some of our learned responses are constructive, but others can escalate conflict and raise the level of danger. How we choose to handle a confrontation is largely based upon our past experience in dealing with conflict and our confidence in addressing it. One can start to change destructive responses to conflict by learning to assess the total impact of negative responses and acquiring confidence in using the tools and techniques of professional peacemakers.

Constructive conflict management is as much a science as an art. It is based on a substantial body of theory, skills and techniques developed from decades of experience in international peacekeeping, peacemaking and peacebuilding. Acquiring a better understanding of the conceptual tools and skills professional conflict managers use can help us gain confidence in addressing conflict in a

manner which resolves the issues and maintains or even strengthens relationships. While we may not all go on to become professional peacemakers, these skills and knowledge can help us in any social setting. These tools can help for example, government officials, address disputes more quickly and effectively, preventing them from growing into domestic or international crises.

Peace

The distinction is sometimes made between 'negative peace' and 'positive peace' (e.g. Galtung 1996). Negative peace refers to the absence of violence. When, for example, a ceasefire is enacted, a negative peace will ensue. It is negative because something undesirable stopped happening (e.g. the violence stopped, the oppression ended). Positive peace is filled with positive content such as the restoration of relationships, the creation of social systems that serve the needs of the whole population and the constructive resolution of conflict.

Peace does not mean the total absence of any conflict. It means the absence of *violence* in all its forms and the unfolding of conflict in a constructive way. Peace therefore exists where people are interacting non-violently and are managing their conflict positively - with respectful attention to the legitimate needs and interests of all concerned.

Reconciliation

Reconciliation becomes necessary when negative conflict has occurred and relationships have been damaged. Reconciliation is especially important in situations of high interdependence where a complete physical or emotional barrier between parties in a conflict cannot be maintained. Reconciliation therefore refers to the restoration of relationships to a level where co-operation and trust become possible again. Lederach (1995) stated that reconciliation deals with three specific paradoxes:

- Reconciliation promotes an encounter between the open expression of the painful past and the search for the articulation of a long-term, interdependent future;
- Reconciliation provides a place for truth and mercy to meet; where concern for exposing what happened and letting go in favour of a renewed relationship are validated and embraced;
- Reconciliation recognises the need to give time and place to justice and peace, where redressing the wrong is held together with the vision of a common, connected future.

Does conflict have to be destructive?

We all know how destructive conflict can be. Whether from personal experience or media accounts, we can all note examples of the negative aspects of conflict. On the other hand, conflict can have a positive side, one

that builds relationships, creates coalitions, fosters communication, strengthens institutions, and creates new ideas, rules and laws. These are the *functions* of conflict. Our understanding of how conflict can benefit us, is an important part of the foundation of constructive conflict management.

FUNCTIONS OF CONFLICT

What positive things have happened to you as a result of conflict? Here are some of the positive aspects noted by Coser (1956):

- *Conflict helps establish our identity and independence.* Conflicts, especially at earlier stages of your life, help you assert your personal identity as separate from the aspirations, beliefs and behaviours of those around you.
- *Intensity of conflict demonstrates the closeness and importance of relationships.* Intimate relationships require us to express opposing feelings such as love and anger. The coexistence of these emotions in a relationship create a sharpness when conflicts arise. While the intensity of emotions can threaten the relationship, if they are dealt with constructively, they also help us measure the depth and importance of the relationship.
- *Conflict can build new relationships.* At times, conflict brings together people who did not have a previous relationship. During the process of conflict and its resolution, these parties may find out that they have common interests and then work to maintain an ongoing relationship.
- *Conflict can create coalitions.* Similar to building relationships, sometimes adversaries come together to build coalitions to achieve common goals or fend off a common threat. During the conflict, previous antagonism is suppressed to work towards these greater goals.
- *Conflict serves as a safety-valve mechanism which helps to sustain relationships.* Relationships which repress disagreement or conflict grow rigid over time, making them brittle. Exchanges of conflict, at times through the assistance of a third-party, allows people to vent pent-up hostility and reduce tension in a relationship.
- *Conflict helps parties assess each other's power and can work to redistribute power in a system of conflict.* Because there are few ways to truly measure the power of the other party, conflicts sometimes arise to allow parties to assess one another's strength. In cases where there is an imbalance of power, a party may seek ways to increase its internal power. This process can often change the nature of power within the conflict system.
- *Conflict establishes and maintains group identities.* Groups in conflict tend to create clearer boundaries which help members determine who is part of the "in-group" and who is part of the "out-group". In this way, conflict can help individuals understand how they are part of a certain group and mobilise them to take action to defend the group's interests.

- *Conflicts enhance group cohesion through issue and belief clarification.* When a group is threatened, its members pull together in solidarity. As they clarify issues and beliefs, renegades and dissenters are weeded out of the group, creating a more sharply defined ideology on which all members agree.
- *Conflict creates or modifies rules, norms, laws and institutions.* It is through the raising of issues that rules, norms, laws and institutions are changed or created. Problems or frustrations left unexpressed result in the maintaining of the status quo.

CONFLICT RESOLUTION: TERMS AND DEFINITIONS

Cooperative problem-solving is an unassisted procedure which includes formal or informal discussions between individuals or groups. With this process parties work jointly to determine the nature of their differences and look for creative alternatives which will allow them to meet their needs, desires or concerns. Parties using cooperative problem-solving do not need to have an especially strong relationship but they must acknowledge a need to collaborate with one another to resolve their differences (CDR, 1997).

Negotiation refers to either competitive processes (positional negotiation) or cooperative efforts (interest-based negotiation). In *positional negotiation*, parties make offers and counter-offers which they feel will resolve the conflict. These exchanges of offers typically start to converge on a solution which both parties find acceptable. Success at positional negotiation is based on a party's ability to bluff the other party about its positions of strength and weakness in order to gain an outcome which is in their favor. *Interest-based negotiation* is designed for parties who have a need to create or maintain healthy relationships. In this type of process, parties discuss the issues which face them and express the interests, values and needs that they bring to the table. Instead of focusing on competitive measures and winning the negotiation, parties collaborate by looking to create solutions which maximise the meeting of their interests, values and needs (Ibid.).

Mediation refers to a process through which a third party provides procedural assistance to help individuals or groups in conflict to resolve their differences. Mediation processes vary throughout the world in form and underlying philosophy. In many Western countries, the mediator is usually an independent, impartial person who has no decision-making authority. In other societies, it may be more important that the mediator is known and trusted by the parties rather than being seen as impartial. Mediation is a voluntary process and its success is linked to the vesting of decision- making authority in the parties involved in the dispute. The mediator structures the process in a way which creates a safe environment for parties to discuss the conflict and find solutions which will meet their interests.

Facilitation is an assisted process which is similar to mediation in its objectives; however, facilitated processes typically do not adhere to a tightly defined procedure. In this type of proceeding, the facilitator works with parties to increase the effectiveness of their communication and problem-solving abilities. The facilitator may be either a third party or a person within one of the groups who is able to provide procedural assistance and to refrain from entering into the substance of the discussion.

Arbitration is a form of dispute resolution where a third party makes the decision on the outcome of dispute. Typically, the parties appoint the arbitrator to render this decision. The arbitrator's decision is either binding or non-binding on the parties depending on the arrangement made prior to entering the arbitration process. Non-binding arbitration is frequently used to assist parties who are deadlocked on a certain issue. While there is no obligation for parties to accept the outcome, the weight of the arbitrator's decision may provide the impetus for parties to reconsider their settlement options (Ibid.).

WHAT CAUSES DISPUTES AND CONFLICT?

Part of developing an effective intervention strategy is knowing the general categories of causes of conflict. One model (see Moore, 1996) identifies five sources of conflict:

1. *Data or information conflict*, which involves lack of information and misinformation, as well as differing views on what data are relevant, the interpretation of that data and how the assessment is performed.

2. *Relationship conflict*, which results from strong emotions, stereotypes, miscommunication and repetitive negative behaviour. It is this type of conflict which often provides fuel for disputes and can promote destructive conflict even when the conditions to resolve the other sources of conflict can be met.

3. *Value conflict,* which arises over ideological differences or differing standards on evaluation of ideas or behaviours. The actual or perceived differences in values do not necessarily lead to conflict. It is only when values are imposed on groups or groups are prevented from upholding their value systems that conflict arises.

4. *Structural conflict*, which is caused by unequal or unfair distributions of power and resources. Time constraints, destructive patterns of interaction and unconducive geographical or environmental factors contribute to structural conflict.

5. *Interest conflict*, which involves actual or perceived competition over interests, such as resources, the way a dispute is to be resolved, or perceptions of trust and fairness.

An analysis of the different types of conflict the parties are dealing with helps the intervenor determine strategies for effective handling of the disputes.

THE CIRCLE OF CONFLICT

The Circle of Conflict is a useful analytical tool for examining disputes and uncovering the root cause of conflict behaviour. By examining a conflict and evaluating it according to the five categories — relationship, data, interest, structure and value — we can begin to determine what causes the dispute, identify what sector is primary, and assess whether the cause is a genuine incompatibility of interests or perceptual problems of involved parties. These insights can assist us in designing a resolution strategy that will have a higher probability of success than an approach which is exclusively trial-and-error (Moore, 1986).

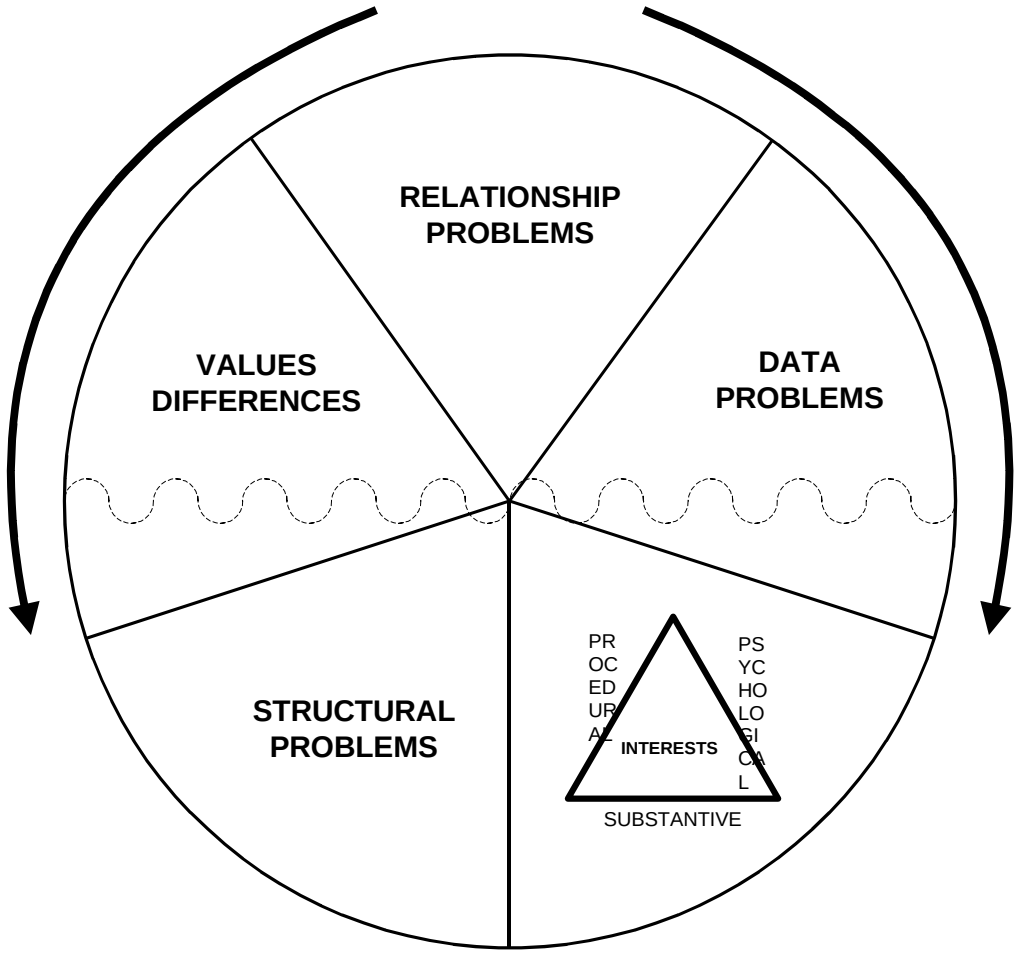


Figure 1: Circle of Conflict (Copyright © 1997 CDR Associates, Boulder, Co.)

B 3.2

Conflict analysis

Code	B 3.2
Teaching topic	Conflict analysis & tools
Time (hrs)	3
Content/Skill focus	Conflict analysis: - Circle of Conflict - Basic Human Needs - Life cycle of a conflict - Practical work
Objectives	1.To provide tools for analysis. 2. To gain practical experience in analysis
Learning methodology	Short inputs Use case study to exercise analytic tools
Trainer/facilitator guide	Introduction Case Study 1 Assign team roles Introduction to tools Small group work on analysis of conflict Plenary summary
Hand out	Mutare play - Mutare case description Mutare play - Background information Pungwe river basin, 1995 *(the latter document only if called for; possibly in a second stage of the play; see course elements B 4.2: Communication skills; and B 4.3 Interest-based processes: negotiation and mediation)*
Course book	"Conflict" , CCR Manual pp. 8-9 "Basic Human Needs And Ethnic Conflict" CCR Ethnicity Manual pp. 10-13
Course reader	L. Nathan, 2001, The Four horsemen of the Apocalypse. *Track Two* **10**(2)
Further reading	

Source: Centre for Conflict Resolution, 2001, "Skills Development Training for Conflict Transformation" Conflict Resolution Manual. United Nations Department for Economic and Social Affairs, New York; pp. 8-9

CONFLICT

THE RELATIONSHIP BETWEEN CONFLICT AND HUMAN RIGHTS

Two dimensions of the relationship between conflict and human rights

There is a cause-and-effect relationship between conflict and human rights that consists of two dimensions:

- Gross human rights violations occur as a consequence of (destructive) conflict.
- The (sustained) denial of political, civil, economic, social, cultural, and other human rights is a core cause of destructive conflict.

Thus, destructive conflict may not only result *in* human rights violations (first dimension), but it can also result *from* violations of human rights when such rights are insufficiently respected and protected over a period of time (second dimension). The sustained denial of human rights can create conditions of social and political unrest as it infringes on the dignity and integrity of human beings and undermines their wellbeing, welfare, and participation in public life.

Challenges to conflict and human rights

The two dimensions of this relationship pose different challenges to human rights and conflict management practitioners and policy makers because the problems they seek to address differ from one dimension to the other. This also applies to the time frame for intervention, the primary activities called for and the desired outcomes, as the figure below shows.

	Dimension 1	**Dimension 2**
	Gross human rights violations as consequence of destructive conflict	Conflict as a consequence of sustained denial of human rights
Problem to be resolved	Protecting people from human rights violations	Reducing levels of structural conflict by promoting and protecting human rights
Time frame	Short to medium term	Long term
Activities to be undertaken	• Dispute resolution • Peacemaking and peacekeeping • Peace-enforcement • Human rights monitoring and investigation	• Peace-building • Development • Institution-building • Reconciliation
Desired outcomes	• Cessation of hostilities • End/prevention of abuses • Negotiated settlement => NEGATIVE PEACE	• Socio-economic and political justice • Constructive conflict-management => POSITIVE PEACE

The two dimensions are interrelated and influence one another

The two dimensions of the relationship between human rights and conflict are connected to each other in a number of ways:

- Violent confrontations (dimension 1) are largely symptoms of structural conflict (dimension 2). As structural conflict is left unaddressed, the frustration, anger and dissatisfaction may rise to such an extent that groups may mobilise to confront perceived injustice.

- Activities undertaken as part of conflict regulation and resolution during potentially violent confrontations (dimension 1) can impact on the prospects for longer term reconciliation and conflict management efforts. If mechanisms are used to constructively address destructive conflict in the short term, they can lay a foundation of trust and help the parties better manage future conflict.

- The desired outcomes for each dimension influence the other. While creating negative peace is the focus of dimension 1, any agreement negotiated within this dimension needs to include agreements on future processes to address peace and justice, reconciliation and institution-building, in order to make the agreement sustainable.

- Efforts towards achieving positive peace are fundamentally tied to the ability of parties to end the hostilities and to prevent violations of human rights so that longer-term peacemaking and peacebuilding processes have sufficient time to meet their objectives.

Thus, considering this cause-and-effect relationship between human rights and conflict, it follows that the protection and promotion of human rights is essential to the management of conflict as it lessens the potential for conflict. This can further be clarified by considering how human rights and human needs are linked together (see next section.)

Source: Centre for Conflict Resolution, 2001, "Ethnicity manual". CCR, Cape Town; pp. 10-13

I BASIC HUMAN NEEDS AND ETHNIC CONFLICT

Ethnic conflict is by its nature deep-rooted. The concept of 'deep-rooted conflict', introduced by John Burton, allows the distinction between conflicts that are more superficial and handled relatively easily through normal bargaining processes, and deep-rooted conflicts that are far more intractable because they are caused by the frustration of basic human needs.[15]

What are basic human needs?

Basic human needs are universal. All people of all times, races and cultures share the same basic needs. They are an integral part of human beings. They are associated with the fundamental drive in human beings to survive, sustain and develop themselves – they form motivations for behaviour. When these needs are not met, a sense of deep frustration results coupled with a strong drive towards meeting the need. Some of these needs are biological (food, shelter, water), others can be psychological, or relate to personal growth and development (identity, autonomy, recognition.)

Needs are not negotiable and cannot be compromised. They are inherent drives for survival and development. It is therefore not possible to negotiate a settlement to a conflict that requires one of the parties to compromise a basic need such as, for example, the need for security. The manner in which the need for security will be met or satisfied is indeed open to negotiation and compromise, but not the fact that people need security.

[15] John Burton 1988. Conflict resolution as a political system. Working Paper 1, Center for Conflict Analysis and Resolution, George Mason University, p. 7.

There is therefore an important distinction between human needs and their satisfiers. Satisfiers can be compromised or ignored, needs cannot. A satisfier for the need for respect (affection), for example, may be to possess an expensive car. Since a whole range of possible satisfiers exist for this need, it is possible to replace this satisfier with another (e.g. the genuine praise of others for a job well done); you can negotiate over satisfiers. The need for respect, however, cannot be compromised – it will continue to exist.

Manfred Max Neef [16] conducted research across the globe in various cultures and concluded that there are nine basic needs that all people of all times share. These are:

- **Subsistence (to have the necessary food and shelter in order to survive)**
- **Identity (to belong)**
- **Freedom (to have control over own destiny)**
- **Security (to feel safe)**
- **Affection (to feel valued, respected and loved by 'significant others')**
- **Understanding (to attach meaning to events and life in general)**
- **Participation (to be part of decisions and events that shape one's life)**
- **Creativity (to express oneself in various ways, e.g. work, art, music, etc.)**
- **Recreation (to rest / relax).**

Where a basic need is not met poverty results. Poverty does not only refer to material poverty, but also to poverty in non-material matters. Some of the 'poverties' that are created by the frustration of the above needs are:

- In the case of subsistense: material deprivation, starvation.
- In the case of identity: loneliness, insecurity, rejection.

[16] Manfred A. Max-Neef 1991. *Human scale development: conception, application and further reflections.* New York: Apex.

- In the case of freedom: oppression, abuse, exploitation.
- In the case of security: fear, physical and emotional pain/suffering.
- In the case of affection: rejection, loneliness, low self-esteem and lack of personal development.
- In the case of understanding: uncertainty, meaninglessness, depression.
- In the case of participation: exclusion, discrimination.
- In the case of creativity: boredom, apathy, stunted growth.
- In the case of recreation: burn-out, depression, meaninglessness.

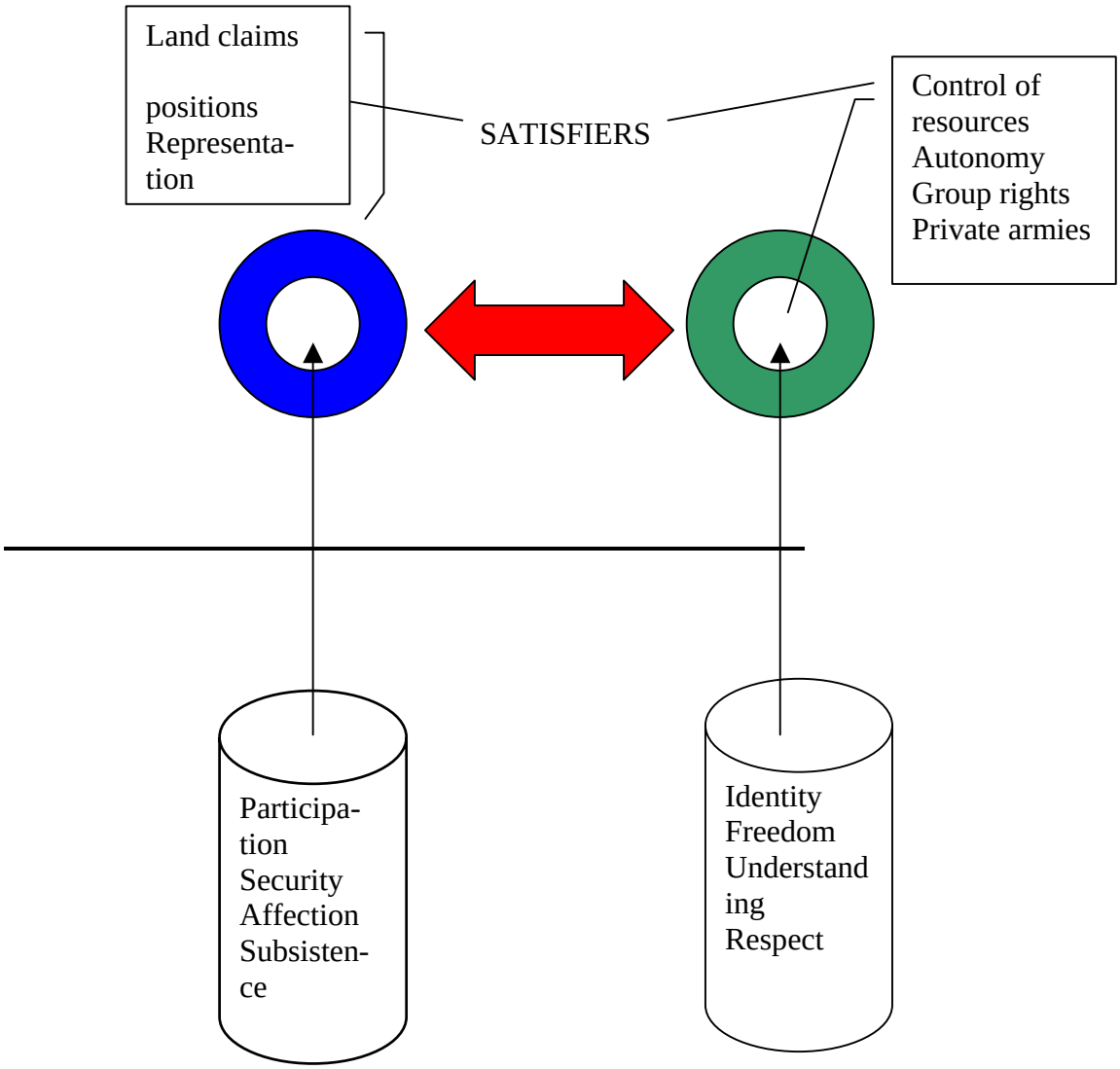
The needs for subsistence, security, identity, freedom, affection and participation are particularly relevant in ethnic conflict. It is the suppression of these needs that inevitably leads to ethnic conflict.

Fig. 1 is a graphic illustration of the way human needs function. Two ethnic groups are in conflict. The declared reasons for the conflict, i.e. their stated positions, are land claims, cabinet positions, etc. Below the surface, however, portrayed as deep storage tanks, are the sources that continue to provide energy to the conflict. An ethnic group's position may be that it wants 30% of Cabinet positions. It is their need to participate coupled with the subsistence need, however, that drives this claim. Or: the bone of contention may be the fact that an ethnic group has armed itself. In this case it is their need for security that 'fuels' this behaviour. Unless this need is addressed measures to solve the problem (e.g. through a display of superior military force) are bound to fail in the long term.

Fig. 1:

'FUELLING' CONFLICT

BASIC HUMAN NEEDS AS THE ENERGY SOURCE OF CONFLICT



BASIC HUMAN NEEDS

B 3.3

Approaches to conflict resolution

Code	B 3.3
Teaching topic	Approaches to conflict resolution
Time (hrs)	1
Content/Skill focus	Approaches to conflict resolution: - Power-based - Rights-based - Interest-based
Objectives	To raise awareness of the strengths and weaknesses of different approaches
Learning methodology	Elicitive discussion
Trainer/facilitator guide	Work with group to identify strengths and weaknesses of each approach.
Course book	
Course reader	W.L. Ury, J.M. Brett and S.B. Goldberg, 1988, Three approaches to resolving disputes: interests, rights and power. In: "Getting Disputes resolved. Designing systems to cut the costs of conflict". San Francisco: Jossey-Bass; pp. 3-19 (Chapter 1)

Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 4

Practice

Table of contents

B 4.1

Trust-building

Code	B 4.1
Teaching topic	Trust-building
Time (hrs)	3
Content/Skill focus	Trust-building - The cost of distrust - Skills/attitudes that enhance trust
Objectives	1.To demonstrate the vital role of trust in negotiations 2. To identify factors that enhance trust
Learning methodology	Exercise: 'Prisoners Dilemma' Elicitive discussion.
Trainer/facilitator guide	Implement and debrief 'Prisoners Dilemma' Elicit discussion on conditions / attitudes that favour trust-building
Hand out	Prisoner's dilemma
Course book	

B 4.2

Communication skills

Code	B 4.2
Teaching topic	Communication skills
Time (hrs)	7
Content/Skill focus	Communication skills: - Perceptions - 4 levels of listening - paraphrasing - cross-cultural communication - open communication - communicating rights in a non-threatening manner - dealing with anger
Objectives	To enhance basic communication skills for managing conflict
Learning methodology	Brief clarification of concepts Introduction to skills Practical exercises Role-plays
Trainer/facilitator guide	'Six blinds and elephant' story. Facilitate discussion on perceptions. Input: 4 levels of listening Explain paraphrasing and practise in fish-bowl setting. Debrief, with focus on cultural relevance. Practise paraphrasing in pairs. Input on non-threatening communication. Use conflict spectrum on a topic that creates division in group, elicit statements but with focus on 'I', allow movement on spectrum with debriefing. Input on management of anger.
Hand out	Mutare play - Mutare case description Mutare play - Background information Pungwe river basin, 1995 *(the latter document only if called for)*
Course book	"Managing Perceptions", CCR Ethnicity Manual pp. 24-31 "Communication", CCR Manual pp. 22-30 "Anger", CCR Lesotho Manual pp. 27-28

Source: Centre for Conflict Resolution, 2001, “Ethnicity manual”. CCR, Cape Town; pp. 24-31

II MANAGING PERCEPTIONS

The management of perceptions in ethnic conflict is particularly necessary in situations where rapprochement is taking place and efforts are underway to facilitate dialogue and re-establish trust. It is also vital in the ongoing task of governance in a diverse society.

Perceptions do not cause conflict. However, they exacerbate conflict and complicate conflict resolution because of the particular dynamics involved in perception formation and maintenance.

Perceptions affect the quality of intergroup communication and mutual trust by imposing filters through which messages are sent. In fact, a group will normally understand a message from their opponents as determined by their own perceptions and not as it was intended by the sender of the message. This means that Group A does not determine what Group B believes concerning Group A. What Group B believes is its own choice and is often influenced by its own fears and desires. Consider the following figures:

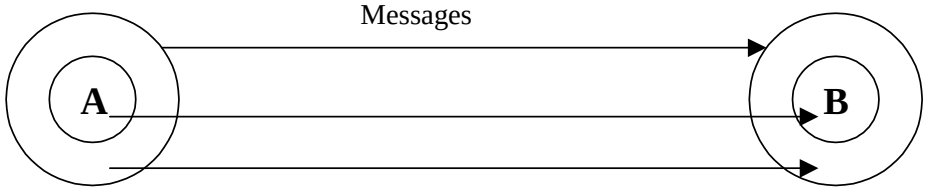


Fig. 3

According to Figure 3 Group B is a passive recipient of the information it receives from Group A. All messages coming from Group A automatically ‘penetrate’ Group B’s consciousness. Communication, however, does NOT happen in this way.

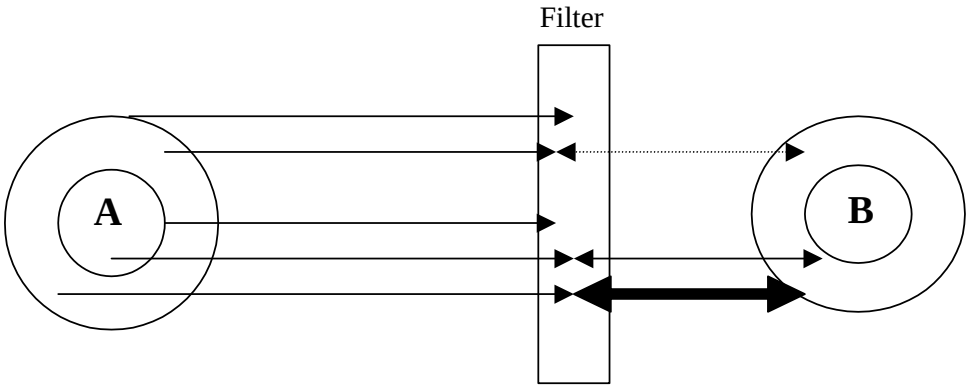


Fig. 4

Figure 4 provides a more accurate description. Communication from Group A to Group B moves through the filter or barrier placed by Group B's psychological readiness to interpret Group A correctly. In reality Group B subconsciously decides what messages it will allow to get through the filter, what messages it will ignore, what messages it will diminish and which ones it will exaggerate.

For example, Group A is a minority ethnic group in a country and is feeling increasingly insecure. They begin to arm themselves, but in all communication with Group B (the dominant group in government) they send the following message: "We are buying weapons to defend ourselves because we feel threatened by the abuse of power by government. We are committed to defend ourselves, but we prefer to live in peace. We understand that violence contains an enormous risk." What Group B hears and does not hear is illustrated below. The thickness or thinness of the arrows portray the intensity with which the message is sent and received.

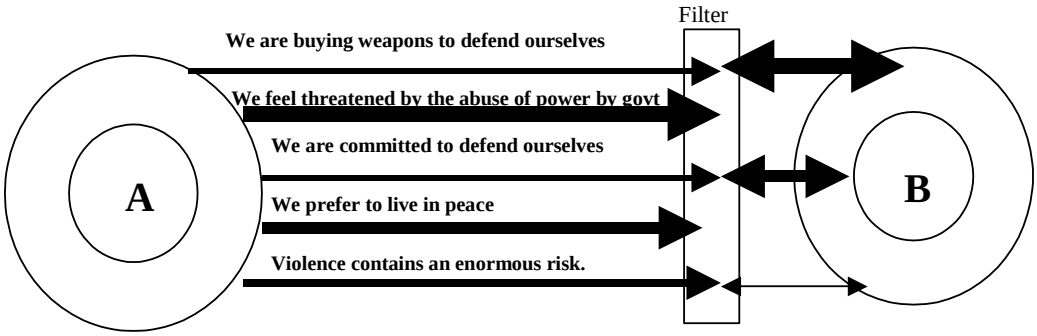


Fig. 5

The psychological readiness to receive accurate communication is determined by, amongst other things, the amount of trust Group B has in Group A or, conversely, the depth of its suspicion concerning Group A's motives and agendas. All of this is deeply influenced by collective perceptions that may have developed over generations. Historic encounters may have led to the growth of myths or legends concerning heroic past encounters, betrayals, injustices and atrocities that were committed, etc.

The depth of suspicion that a group harbours concerning its opponents, as exacerbated by perceptions and myths, contribute to the 'irrationality' of behaviour that often accompany ethnic conflict. Outside commentators or analysts often comment on this aspect of 'irrationality'. They find it difficult to understand why groups of people hate each other so passionately and are so utterly committed to the other's destruction. They may typically (and patronisingly) shake their heads in disbelief, shrug their shoulders and move on.

The seeming irrationality of a conflict is explained by the way in which people experience the frustration of their basic human needs [see Box: *Identity as a basic human need*]. Perceptions and myths capture the way in which people have interpreted the frustration or trauma, or have justified the exploitation. Outsiders who do not understand or make no attempt to understand the

perceptions of the groups in question will almost inevitably fail to comprehend the rationality of groups' behaviour.

In order to develop the skill to manage perceptions it is important to develop a personal awareness of the presence and functioning of perceptions in one's own life. (Cf. the exercise on the 'Six blind friends and the elephant'.) No-one has a 100% accurate understanding of "The Truth". In the final analysis we only have perceptions. When we look at a situation and make a judgement, we are influenced by our own background, culture, gender, class, experience, religion, ideology, etc. These influences mean that we are not seeing the same picture in exactly the same way as another person with a different background, culture, gender, class, experience, religion, ideology, etc.

It is therefore possible that two honest persons or groups of people can reflect on the same experience or look at the same situation and come to different conclusions without anyone of them being dishonest. Conflict is created by clinging to one's own 'truth' while denying the 'truths' of others.

PERCEPTIONS THAT IMPACT ON ETHNIC CONFLICT

Culturally determined perceptions

Culture is more than just a set of customs and rituals. It is also a collective world-view, a manner of understanding historical and environmental realities forged through centuries of interaction. It impacts on the basic understanding of and attitude towards matters such as responsibility, individuality, communality, authority and causality. Culture therefore impacts on the way one understands one's environment, one's own role and responsibility within it, and one's interpretation of the role of other groups within the same environment.

Perceptions created by a psychological need for self-esteem

- The self-esteem of individuals is deeply connected to the esteem of the ethnic group. Given the need for a positive self-esteem, ethnic groups reveal a fundamental drive towards establishing a favourable self-esteem vis-à-vis other groups through processes of intergroup comparison and the subconscious filtering and censoring of information concerning other groups. Perceptions about other groups are therefore negatively influenced by a group's need to establish its own self-worth and to favour itself.[17]

- Groups make an assessment of their well-being in the first place not through an objective analysis of their conditions, but rather through comparisons with significant other groups. They will determine their status of deprivation by establishing the discrepancy between what they have and what they feel entitled to. What they feel entitled to may be fed by rising and often unrealistic expectations and is determined by their perceptions of relative status. This dynamic of **relative deprivation** has been indicated as an important contributor to social conflict.[18]

[17] Tajfel, Turner and others developed the 'social identity theory'. See Henri Tajfel 1982, "Social psychology of intergroup relations", *Annual Review of Psychology*, 33, p. 1-39. See also Rupert Brown in Miles Hewstone et al (eds.) 1988, *Introduction to social psychology*, p. 400-404.
[18] Brown in Hewstone et al 1988, op. cit., p. 407

- Ethnic groups who find themselves in conflict may employ various psychological mechanisms leading to exaggerated perceptions of the justifiability and moral superiority of their own position and the basic evil of 'the other'.[19] The creation and nurturing of an **'enemy image'** is an important mechanism to lessen the emotional and moral stress of conflict, but also to maintain a sense of the 'good' self.

Perceptions created by the selective interpretation of history

An important part of the process of maintaining ethnic identity is the **continuous interpretation of historical events**. This interpretation is invariably selective and aimed at enhancing the self-esteem of the group (the glorious past) and/or its sense of victimhood (the evilness of the enemy). By attaching religious or ideological meaning to such selective interpretations, they are strengthened to the point of acquiring the status of absolute truth. Of particular importance is the fact that new generations are socialised into a selective understanding of the past and thus internalise these perceptions.[20]

In conclusion

Each ethnic group lives within a constructed reality concerning its own worth relative to other groups, its own sense of entitlement and the threat posed to its well-being by other groups. The fact that this is a constructed reality does not mean that it is devoid of objective truth. The constructed reality is rather an interpretation of material conditions in the light of past experiences and fears of the future. The successful management of ethnic conflict is dependent on the ability to have insight into the deeper layers of each group's 'reality'.

[19] Chris Mitchell 1981, *The structure of international conflict*, p. 99-117; VD Volkan 1989, "Psychoanalytic aspects of ethnic conflicts", in Joseph V. Montville (ed.) 1989, *Conflict and peacemaking in multiethnic societies*, p.81-91. Volkan describes, for example, the effect of projection: it is when "unacceptable unconscious impulses, attachments, and thoughts - after undergoing a certain degree of distortion - enter an individual's consciousness in the form of external perceptions. Another person or group ... is then perceived as the 'container' of the individual's previously unconscious unacceptable psychic content"

[20] See Gerhard Maré 1993, Ethnicity and politics in South Africa, p. 27.

THE MANAGEMENT OF PERCEPTIONS

The most basic rule in any attempt to manage perceptions is to treat them with respect. People act according to their perceptions because *for them* their perceptions are completely true. There is therefore no use or profit in ridiculing or denying such perceptions. People do not deliberately set out to develop false belief systems or explanations of events. They are serious about what they believe.

The core competencies that are required to manage perceptions are:

- An awareness of one's own biases, perceptions and belief systems (as discussed above).
- The ability to analyse a conflict from the inside out. That is, the ability to base an analysis not on suspicion, but on an intimate understanding of the perceptions of all groups involved in the conflict. This is the skill of empathy.
- The ability to listen with great sensitivity and to communicate in a non-threatening manner.

Analysis

An analysis of the causes of a conflict will determine the action that will be taken. Conflict analysis is therefore a very important activity in the conflict resolution process. Conflict analyses pretend to be objective. No-one will present an analysis of a situation stating that it is subjective and biased. In reality, however, conflict analysis is deeply influenced by the perceptions of the persons doing the analysis. This is particularly the case when the conflict analysis is done by one of the parties in the conflict. The simple fact is that we look at conflict through the lenses of our own spectacles. We interpret events according to our own pre-suppositions. More dangerously: we interpret events in the light of our own deep fears and desires.

The **assumption** of this training slot is that it is possible (a) to develop greater awareness concerning your own biases when engaged in conflict analysis; and (b) to develop the quality of empathy.

By **empathy** is meant the ability to understand the motivation for another person's behaviour almost from the inside of that person. It is the ability to situate oneself (to the extent that it is possible) inside the deeper chambers of the other person's soul, understanding his or her rational, emotional and volitional processes from the inside out. Empathy can only be achieved through very careful listening. The major danger in this respect is the *assumption* that I have empathised sufficiently, that I understand the deeper motivation for the other person's behaviour, whereas in fact I have projected *my own* fears or desires onto that person. A key aspect of empathy is the ability to distinguish between what is happening deep inside myself and what is happening in another person and not to confuse the two.

The key ingredients of empathy are the skills of active listening and non-threatening communication.

Source: Centre for Conflict Resolution, 2001, "Skills Development Training for Conflict Transformation" Conflict Resolution Manual. United Nations Department for Economic and Social Affairs, New York; pp. 22-30

COMMUNICATION

WHAT IS COMMUNICATION?

One of the deepest needs of all human beings is to feel understood and be accepted by others. Offering understanding to another person is a potent form of empowerment. We need not agree with others to empower them in this way; we need only to make it clear through our eyes, body posture and tone of voice that we want to see the world from their perspective. Our interactions with others must come from a point of deep, non-judgmental interest. The key is to grasp the why behind what is being said or done in order to gain insight into the deeper interests and needs of the person with whom we are communicating. From the moment that people feel you are truly seeking to understand, they begin dealing with problems and other people more constructively. Good listening skills are used throughout any process designed to constructively resolve conflict. Good listening is, perhaps, the most significant skill a mediator or facilitator brings to assist parties in conflict.

ACTIVE LISTENING

Active listening is a communication skill used by mediators and facilitators to aid communication by helping parties deliver clear messages and know that their messages were heard correctly. It is also an indispensable skill for interest-based negotiators.

Objectives of active listening

- To show the speaker that his/her message has been heard.
- To help the listener gain clarity on both the content and emotion of the message.
- To help speakers express themselves and to encourage them to explain, in greater detail, their understanding of the situation and what they are feeling.
- To encourage the understanding that expression of emotion is acceptable and that it is useful in understanding the depth of feelings.
    - To create an environment in which the speaker feels free and safe to talk about a situation.

The four levels of listening

Active listening takes place on four levels:

- 'The head': listening for facts and other forms of information.
- 'The heart': listening for feelings. Conflict is often associated with strong feelings such as anger, fear, frustration, disappointment, etc. Strong feelings often block the way to rational discussions and therefore have to be identified and dealt with before proceeding to substantive matters.
- 'The stomach': listening for basic human needs. Identify what basic needs are driving the conflict and distinguish between needs and satisfiers.
- 'The feet': listening for intention or will. Identify in which direction the person/group is moving and how strong their commitment is.

Procedures for active listening

- Acknowledge that you are listening, through verbal and non-verbal cues.
- Listen at all four levels and reflect your impressions through using the various active listening skills.
- Let the speaker acknowledge whether or not you have reflected their communication and its intensity correctly. If it is not correct, ask questions to clarify and reflect a modified statement to the speaker.

Principles underpinning effective listening

- That the environment created for the speaker to express herself or himself is safe, especially in terms of reducing the risk of future negative consequences for messages delivered.
- That the listener is very focused on what the speaker is trying to communicate to her/him.
- That the listener is patient and does not jump to conclusions about the message.
- That the listener can show genuine empathy for the speaker.
- That the listener uses techniques which permit the speaker to verify or correct the emotion and content of the message.
- That the listener does not judge or make value statements about what the speaker is feeling.

How to achieve the goals of active listening:

- Be attentive.
- Be alert and non-distracted.
- Be interested in the needs of the other person, and let them know you care about what is said.

- Be a non-judgmental, non-criticising "sounding board".

Don't:

- use stock phrases like "*It's not so bad", "don't be upset", "you're making a mountain out of a molehill", "just calm down".*
- get emotionally hooked, angry, upset, argumentative. Don't let your values/biases interfere with what you understand is being said.
- rehearse in your own head.
- jump to conclusions or judgements.
- interrogate or give advice.

Ways to listen effectively:

1. **Use your body** to create a positive atmosphere with your non-verbal behaviour. i.e.:
   - appropriate eye contact.
   - nodding the head, facial expressions, gestures.
   - body oriented toward the speaker (head, arms, legs).
   - tone of voice.

   Some researchers say that 80% of communication is body language, that is, what we do with our bodies, our faces, our eyes, and our tone of voice as we are speaking. Every culture has its own body language and mediators must think critically about how to use body language in such a way that the message comes through: "I am eager to hear and understand you."

2. **Encourage responses**. "Tell me more" or "I'd like to hear about ..."

3. **Summarise** the basic viewpoints of the speaker as you've heard them. A summary is an extended restatement of the key points of information offered by the speaker. Use summaries to focus the speaker in terms of issues and solvable problems, instead of personalities.

4. Make **brief notes** on your pad to keep track, but don't bury yourself in them!

5. **Paraphrase** or restate in your own words.

PARAPHRASING

Paraphrasing or restating what the speaker has said in your own words is a powerful tool:

- for communicating understanding to others.
- for moving the conversation to deeper levels — a good paraphrase often brings further, more reflective responses from others.
- for slowing down the conversation between the parties.

- for “laundering” vicious or insulting statements so as to be less inflammatory while retaining the basic points that were made.

How to paraphrase:

1. **Focus on the speaker.**
   - *“**YOU** felt...”, “You’re saying...”, “you believe...”*
   - **NOT** - “***I** know exactly how you feel. **I've** been in situations like that myself.”*

2. **Paraphrasing can be effective at all four levels:**
   - **Restate facts:** *“Your crops have again been destroyed by your neighbour’s cattle”*
   - **Reflect feelings:** Body language and tone of voice will clue you to feelings. *“and you feel angry, bitter and worried about what your family will eat”*
   - **Reflect needs:** *“You need financial compensation and you need convincing assurances that this will not happen again (security)”.*
   - **Reflect will or intention:** *“You want to solve the problem as soon as possible”.*

3. A paraphrase contains no judgement or evaluation but **describes empathetically**:

- *“So you believe very strongly that...”*
- *“You were very unhappy when she...”*
- *“You felt quite angry with Mr. X in that situation...”*
- *“The way you see it then...”*
- *“If I'm understanding you correctly, you...”*

4. **Act like a mirror not a parrot.** Paraphrase mirrors the meaning of the speaker's words but does not merely parrot the speaker; e.g.:
   Speaker: *“I resented it deeply when I found out that they had gone behind my back. Why can't they come and talk with me, and give me a chance to sort things out with them?"*
   Paraphrase*: “You were quite hurt that they didn't come directly to you to resolve things”.*
   NOT*: “You resented it deeply that they went behind your back. You wish they had given you a chance to sort things out with them."*

5. A paraphrase **should always be shorter than the speaker's own statement**, and is used after specific points. A summary is similar to a paraphrase but is longer and is used to summarise all the key points that have been made by one party in a statement.

6. Paraphrasing and other communication skills e.g. questioning can be extremely useful in:

- laundering language, i.e. rephrasing the statement so that insulting words are omitted.
  Speaker: "*He is a liar".*
  Paraphrase: *"You find it difficult to believe him."*
- dealing with generalities and moving parties to specifics, e.g. *"He **always** comes in late..."* Response: *"When does he come in late?" "What is he late for?"*
- unspecified noun/verb e.g.: *"I just don't like that sort of thing".* Response: *"Tell us what you dislike". "He always talks with two tongues".* Response: *"When did he make contradictory statements." "What is it that he said and to whom?"*
- speaking for others, eg*. "I happen to know that no-one around here trusts him."*
  Response: *"Speaking from your own experience with Mr X, tell us more about what you're upset about.."*
- highlighting the positive*.*

HONEST COMMUNICATION

Aims

- To communicate clearly and cleanly my perception of and feelings about a problem without attacking, blaming or hurting the other person.
- To open a discussion without eliciting defensiveness from the other person.

Strategy

In addition to good listening, conflict management depends on honest talking.

When people are confronted with a situation that makes them very uncomfortable, they normally respond in one of two ways. Either they flee or they fight - flight or fight. There are times when it is necessary to flee (e.g. when attacked by a gang) or to fight (when one's life is threatened). But on the whole these typical responses are not very helpful to *resolve* problems.

For example: Mrs Matshediso is a Mathematics teacher trying to teach difficult concepts to her class at the end of a school day. She has a headache and feels very tired. Ntjantja, a pupil, does not understand Mathematics well, is frustrated and bored and starts talking to her friend – in spite of the fact that the teacher has asked them to concentrate.

The flight response is as follows: Mrs Matshediso storms out of the class, goes to the staff room, drinks a headache pill and sits down to wait for the end of the day. She has avoided a confrontation with Ntjantja, but has the problem been solved?

The fight response: Mrs Matshediso shouts at Ntjantja: "You are a disobedient and useless child. You will fail this subject and get nowhere in life. Get out of my classroom!" Mrs Matshediso has confronted the problem, she has attacked. But again, has the problem been solved?

There is a third way to handle this situation. Mrs Matshediso can use 'I language'. 'I language' or an 'I message' is to communicate exactly how I feel without avoiding the problem, but also without attacking, blaming or insulting the other. She may, for example, say: "Ntjantja, I have a headache and I am very tired. When I see you talking while I am trying to explain these difficult sums to you I feel deeply irritated. I feel as if you are not respecting me. Can you help me to understand why you are doing this?"

In this type of 'honest talking' or 'I language' two things need to happen:

- I have to focus on my own feelings and thoughts and communicate them as *mine.*
- I do not blame or attack the other, nor do I accuse or insult them. I am saying to the other person that I have these thoughts and feelings because of his or her behaviour, and I create an openness for them to respond.

A possible syntax for an 'I message':

		example	example	complete own example
The Action	Objective Description	When (You)	*When you give me instructions as if I am a child*	
My response	No Blame	I feel… Or I feel like…	*I feel insulted and powerless* Or *I feel like sabotaging your plans*	
My preferred outcome	No Demand	And what I'd like is that I …	*And what I'd like is that I have more involvement in the decision-making process and be treated with respect.*	

Some questions to ask myself when I am constructing an I message:

- Is my message 'clean' in the sense that I am not blaming, accusing or insulting?
- Am I stating the problem accurately and honestly?
- Have I stated my feelings clearly and honestly?
- Have I made the statement in such a way that it will lead to an open discussion or have I closed the matter through what I said or the way I said it?

FRAMING AND REFRAMING
HELPING PARTIES MOVE BEYOND RHETORIC AND THREATS

What is a frame?

When talking about *framing* and *reframing* it is necessary to describe what we mean by the term *frame.* Think of it as a picture frame which surrounds an event or interaction. Within this frame is the picture we are trying to communicate. A piece of artwork such as a painting may show us a picture of a person, a landscape, or perhaps something more abstract. When we use the term *frame* in a conflict setting, we are talking about the words, gestures and emotions a party uses to describe the event, what they want or how they feel.

Framing is what parties do to 'paint their picture' of the situation. Framing is also used by intervenors to help the parties give richer meaning to this picture. This often includes getting a clearer definition of events, feelings and needs and helping parties understand the symbols they are using to create meaning.

Reframing is often used by intervenors to assist parties in redefining their 'picture' in ways which help move them beyond rhetoric, threats or other types of communication which impede progress towards resolution of the conflict. It may include rephrasing issues in a way which helps parties move from guarding their positions and towards cooperative problem-solving.

Purposes of Framing and Reframing (CDR, 1997)

- Define or re-define the way parties describe events, emotions and needs.
- Add clarity to the meaning parties are trying to relate to the intervenor and other parties.
- Help parties gain a better understanding of events and their own feelings and needs.
- Change the perspective on certain events or understandings of the situation.
- Help move parties away from positional negotiation to interest-based negotiation.
- Break negotiation deadlocks by breaking down the issues or making them more general.
- Soften or strengthen demands or threats.

- Change the perspective of emotional or value-laden messages to enhance understanding.

How to Reframe (Ibid.)

- *Change the person delivering the message*. There are times when people cannot listen to a message delivered by another individual. They may, however, be able to hear the same message if it is delivered by someone else. It may only need to be communicated by another representative of the party, another party involved in the negotiations, the facilitator/mediator or a respected outsider.
- *Use active listening skills to paraphrase, restate, clarify, validate and summarise.* Active listening skills form the foundation for reframing because these techniques are designed to aid the communication process. They can be used to remove emotional or value-laden language and provide periodic summaries and order to communication between parties.
- *Change the meaning of a message.* Reframing is often used to help parties identify interests which underlie their positions in a conflict. It can also be used to increase the manageability of the issues to a conflict by making them smaller and easier to resolve or making them more general so that it is easier for parties to identify common ground.
- *Change a party's perspective.* Reframing is also used to change the perspective a party has, permitting them to see things is a new way. This can be done by changing the context of the situation and having parties reconsider how they might handle a similar situation in a different context. Also, intervenors can try to get parties to consider the situation from the other party's perspective, or they sometimes help parties keep an eye on the bigger picture by using common ground or minimising differences.

Reframing is often used when the communication between parties is building tension or moving them towards a deadlock. It is used to help them re-define the situation to remove a problem-solving blockage.

Source: Centre for Conflict Resolution, 1999, "Lesotho manual". CCR, Cape Town; pp. 27-28

ANGER

- Feeling angry is just as normal as other feelings we experience -- like feeling disappointed, frustrated or excited. When we experience anger our bodies undergo many physiological changes to prepare us to act in the stressful situation.

- Anger is an emotion that can lead to negative consequences if it is not channelled constructively. We need to learn how to manage our anger so that it doesn't end up hurting us and other people.

- Anger is expressed differently by different individuals. How we perceive the behaviour of others depends on the individual. We might think of those who don't show anger visibly as being un-feeling or incapable of expressing emotion. We might think of those who are very verbal with their anger as being volatile, hot-headed and unable to control their emotions.

  Think about the way in which **you** usually deal with your anger. How do you think others would describe your behaviour or reactions?

- Anger is often a shield, which protects deeper, underlying emotions such as fear, hurt or humiliation. A wounded lion is far more aggressive than usual. She realises that she is weaker and unable to function at her best and in an effort to protect herself she becomes aggressive and reacts viciously to the slightest provocation. Anger serves the same function in human beings. When we are hurt or compromised in any way our bodies get ready for protection and we prepare for attack – We become angry!

  Unlike the wounded lion we do not have to stay angry or aggressive for the entire time we are wounded. Acknowledging, venting and working through our anger in a constructive way brings us face to face with the wound – the hurt, pain or fear. Instead of protecting ourselves with aggression toward others we can focus our attention on ourselves and heal the wound. Others will be more willing to assist us in the healing process than to tolerate on-going aggression.

- Anger is often triggered by the desire or expectation that things should have been done differently, or that they should be different or better. In this case, our anger is usually directed at people, groups, situations or things that we believe block our expectations.

- We all have buttons which activate our anger. Particular actions, words, behaviours of other people or situations eg. a slow moving queue can trigger us. Different people have different buttons / triggers.

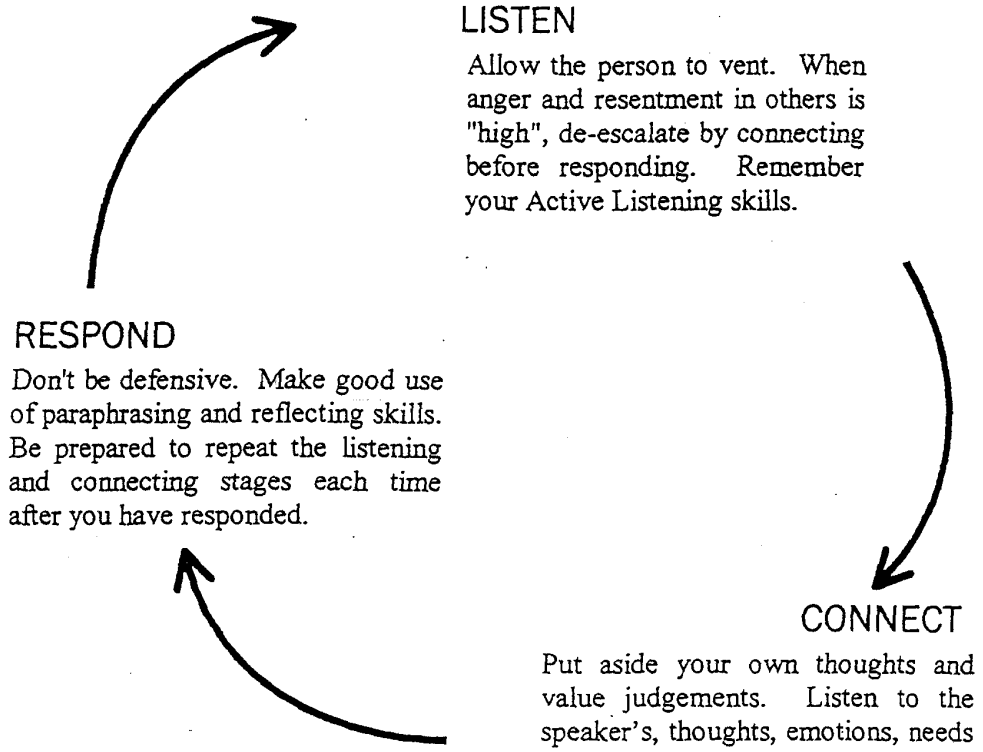
- Someone who can make us angry or press our buttons can actually end up controlling parts of us -- our time, our energy, our emotions and our ability to function effectively, if we allow this to happen.

- What we believe about ourselves and others and what others believe of us affects how we act. If we assume that someone, eg. our youngest child, is naturally aggressive and that their expression of anger will always be in the form of aggression, and we continually label them and treat them with this in mind, s/he can actually take on these characteristics and **become** an "aggressive" person. Then, when the child does not live up to the expectations we have of the other children, it's easy for us to turn around and say: *"See! It's just human nature"* or *"He can't help it - - he was born angry!"*

- "Healthy" anger is different from hostility, which is unfriendly, deep-seated and usually directed at "an enemy".

- As with any behaviour, dealing constructively with anger gets easier with practice.

HINTS FOR DEFUSING ANGER



B 4.3

Interest-based processes: negotiation and mediation

Code	B 4.3
Teaching topic	Interest-based processes: negotiation and mediation
Time (hrs)	7
Content/Skill focus	Interest-based processes: negotiation and mediation
Objectives	1.To introduce the principles of interest-based conflict management. 2. To clarify roles. 3. To introduce a mediation model. 4. To provide practical exercise in mediated negotiations
Learning methodology	Inputs. Role-play based on case study. Debriefing.
Trainer/facilitator guide	Highlight the principles of an interest-based approach. Clarify roles in negotiation, conciliation, facilitation and mediation. Introduce the 4 phases of mediation. Construct a role-play on the basis of the case-study. Implement role-play and debrief.
Hand out	Mutare play - Mutare case description Mutare play - Background information Pungwe river basin, 1995 *(the latter document only if called for)*
Course book	"Negotiation", CCR Manual pp. 15-23 "Mediation", CCR Manual pp. 33-54
Course reader	L. Nathan "When Push comes to Shove" Track Two
Further reading	Fischer & Ury: "Getting to Yes"

Source: Centre for Conflict Resolution, 2001, "Skills Development Training for Conflict Transformation" Conflict Resolution Manual. United Nations Department for Economic and Social Affairs, New York; pp. 13-21

NEGOTIATION

WHAT IS NEGOTIATION?

Negotiation is a voluntary attempt to resolve conflicts that arise from competing needs, interests and goals. It is a problem solving approach in which parties seek agreement rather than resort to violence and force. In situations where relationships are threatened or have been harmed, high mistrust exists and violence has occurred, negotiation as a problem solving approach is particularly difficult but all the more relevant.

When a dispute arises, parties will attempt to resolve the matter through power-based, rights-based or interest-based methods. *Power-based* procedures determine who is more powerful, implying that the stronger party should get to determine the outcome. *Rights-based* methods are based upon an organisation's or society's laws, norms and values. In a given situation, the decision is made by using some independent set of criteria to determine fairness or which party's claim is more legitimate. *Interest-based* procedures seek to reconcile the needs, desires and concerns of the parties involved (Ury, Brett and Goldberg, 1988).

In a conflict where tensions have escalated, disputants often rely on more powerful techniques to resolve their differences. They may move from interest-based to rights-based and power-based techniques in order to communicate their message. The problem with this is that generally rights-based and power-based approaches are more costly. In organizations, communities and institutions which are experiencing a great deal of conflict, the environment tends to become distressed .when disputants increasingly use more power-based means to resolve issues. In these situations, the challenge is to move parties away from more costly methods to alternative ways of resolving their differences.

Costs of using power to resolve conflict

Generally, more powerful conflict resolution procedures incur higher costs. The following list notes four costs of greater use of power in attempting to address conflict (Ibid., p. 15):

1. A greater strain is placed on relationships.

2. Disputes start to recur with greater frequency.

3. While disputes may be settled, parties are less satisfied with the outcome.

4. Interactions between the parties require more resources, emotional energy and time.

STRATEGIES AND OUTCOMES OF A DISPUTE

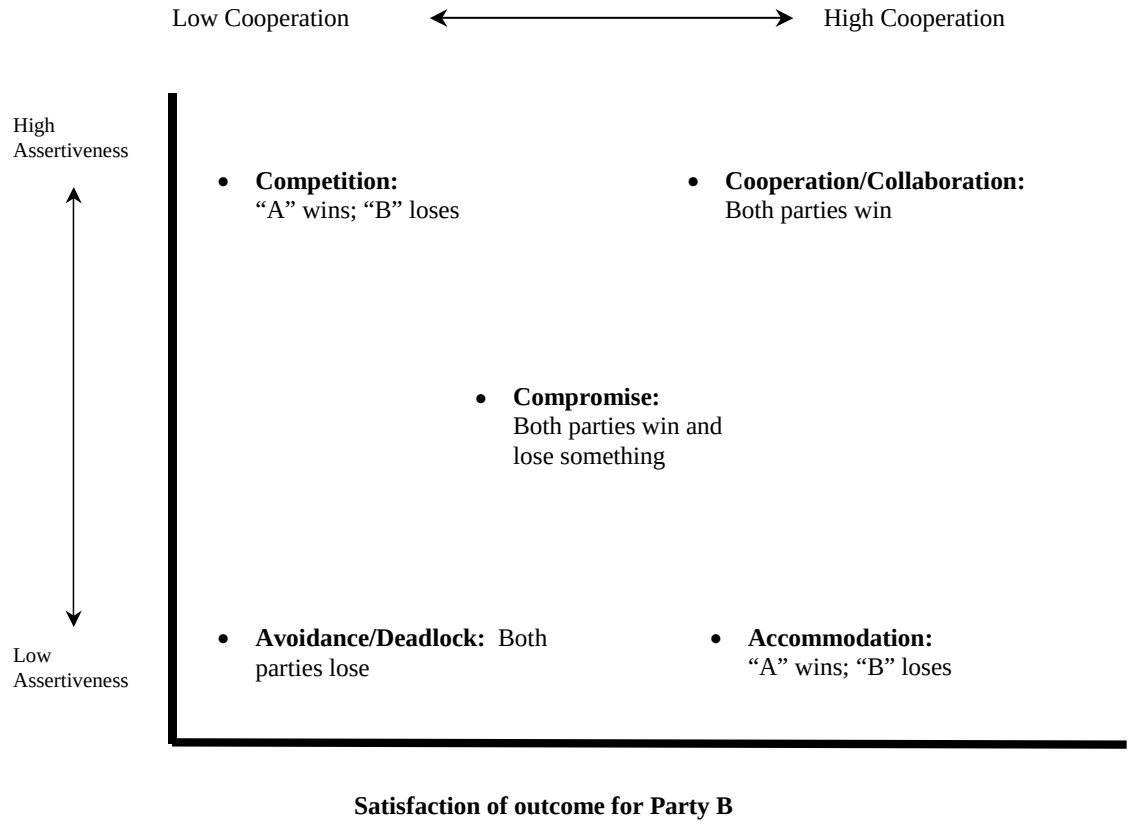


Figure derived from Kilmann and Thomas, "Interpersonal conflict-handling behavior as reflections of Jungian personality dimensions." *Psychological Reports.* 37, 1975. pp. 971-980.

POSITIONS AND INTERESTS

Positions are a party's stated solution to the conflict. It is what they say they want. In a labour dispute, a union might state a *position* of wanting a 10% increase in wages. Positions are often tied up with satisfiers of basic human needs.

Interests are the basic needs, concerns, fears or values which underlie their position in a conflict. In the above labour dispute, the *interests* are what lead them to make a certain demand; however, their interests may only be partially met by money. There may also be interests related to fewer working hours, better benefits or gaining a greater measure of respect from management.

Types of Interests

Moore (1996) identifies three different types of interests:

- *Substantive,* which relate to physical resources such as money, land or time.
- *Psychological,* which relate to issues of trust, fairness and respect.
- *Procedural,* which relate to the way the dispute will be resolved, who will be involved and how decisions will be made.

These three types of interests are inter-related. If resolution of the conflict is geared only towards meeting substantive interests, the resulting agreement may fail. Take the case of a development project which is designed to meet the needs of a squatter community. The squatter community may have substantive interests related to housing, water and electricity. In addition, they may have psychological interests of respect and fairness. They might also have procedural interests related to how decisions are made, about what is going to be developed and how the new resources are allocated. If these three types of interests are not met, the development project may never get off the ground. There are many examples of development projects which were left in ruins through neglecting psychological and procedural interests such as *consulting with the project's recipients* and *determining how decisions about the project are made*.

POSITIONAL NEGOTIATION

What is positional negotiation?

Positional negotiation refers to a competitive process in which parties make offers and counter-offers which they feel will resolve the conflict. Positional negotiations start with parties making an offer which will maximise their benefit. Each party then attempts to draw the other into their bargaining range by using a series of counter-offers and concessions. These exchanges of offers typically start to either converge on a solution which both parties find acceptable or, if parties remain far apart, brings them to an impasse. This type of process tends to end in compromise, where gains and losses to both parties are distributed according to the ability of the negotiators and strength of their negotiating position.

When do parties use positional negotiation? (Moore, 1996)

- when the stakes are high
- when parties are negotiating over resources which are limited such as money or time
- when there is little or no trust between parties
- when a party perceives that it benefits from making the other party lose
- when the parties' need for a continuing cooperative relationship is of lesser priority than a substantive win at the table
- when parties have sufficient power to damage the other if they reach an impasse

The positional negotiation process (adapted from CDR, 1997)

Determine your best solution

What solution would meet all of your interests and needs? Determine what outcome would be most beneficial to you. Factor in the highest assessment of your ability to negotiate and the strength of your negotiating position.

Determine your bottom line

What is the point beyond which you cannot go? Determine what outcome would be least beneficial but still acceptable to you. Factor in the lowest assessment of your ability to negotiate and the strength of your negotiating position. Also determine your *best alternative to a negotiated agreement (BATNA).*

Determine the best solutions and bottom lines of the other parties

What do you expect the opening positions of the other parties to be? Why do you think they will make these demands, that is, what are the underlying

interests and needs which prompt them to take a certain position? Where do you think they will set their bottom line?

Of the range of issues under negotiation, what are the priorities that the other parties attach to these issues? Why?

Create a negotiating strategy

Review your targets and the targets of the other parties. Are there issues upon which you can both easily agree? Are there similar interests which create common ground between parties? Are there points you can concede in order to gain a more acceptable outcome on issues which are of greater importance to you? Are there issues on which you cannot concede or compromise?

For each issue subject to negotiation, develop an opening position which is based on your best solution. Set your bottom line. Then create fallback positions which make concessions of increasing importance. As you are setting these positions, determine how and when you will move to back-up offers. Also consider how you will explain your positions to the other parties. Educate them on why you are taking a certain position, why they may need to lower their expectations and how your position meets the interests of the other parties.

Getting started

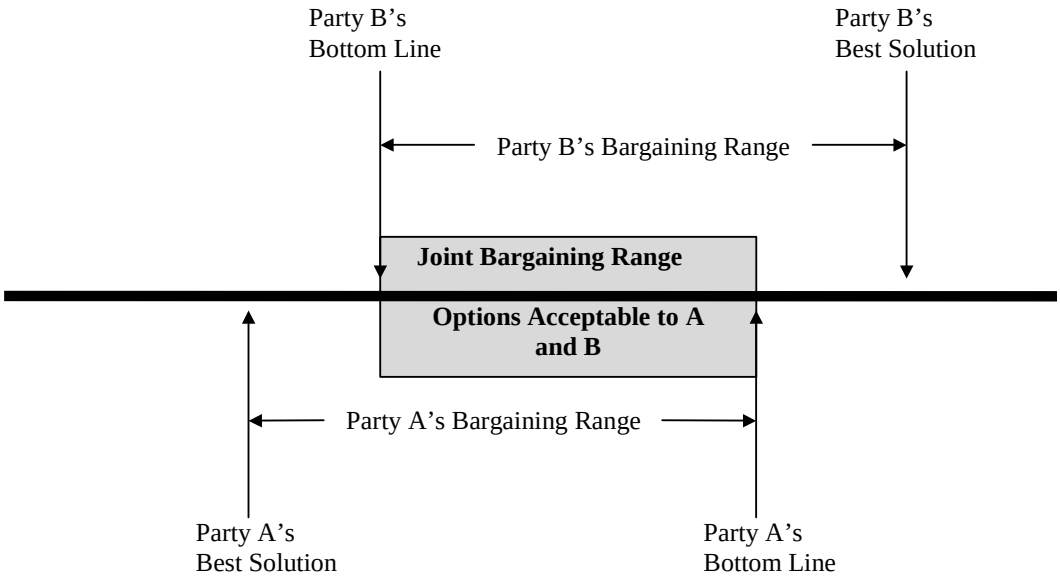
Consider the order of issues subject to negotiation. Is there a logical sequence? Are there relatively easy issues on which you can quickly gain agreement? If so, consider dealing with these first to build momentum for subsequent issues.

Open the negotiations with an offer which is close to your best solution. Explain to parties why you need this solution. Get other parties to explain why they need a certain solution. Look for underlying interests that are common to all parties or which you can easily meet.

Optimizing solutions

Keep an eye on your bargaining range. Look for offers which fall within this range. Keep track of the types of benefits or concessions which you can offer to make certain alternatives favorable to other parties. If the negotiations start to deadlock, consider your *BATNA.* Use this to determine if and how you can compromise to accept certain settlement options.

Determining the bargaining range



Styles of Positional Negotiation

Soft and hard positional negotiation

SOFT	HARD
Participants are friends	Participants are adversaries
The goal is agreement	The goal is victory
Make concessions to cultivate the relationship	Make concessions as condition of the relationship
Soft on people and the problem	Hard on people and the problem
Trust others	Distrust others
Change position easily	Dig in to position
Make offers	Make threats
Disclose bottom line	Mislead as to bottom line
Accept one-sided losses to reach agreement	Demand one-sided gains as the price of agreement
Search for the single answer: the one they will accept	Search for the single answer: the one you will accept
Insist on agreement	Insist on your position
Try to avoid a contest of will	Try to win a contest of will
Yield to pressure	Apply pressure

(Source: R. Fisher and W.Ury: Getting to YES. 1991)

INTEREST-BASED NEGOTIATION

What is interest-based negotiation?

Interest-based negotiation is designed for parties who have a need to create or maintain healthy relationships. In this type of process, parties discuss the issues that face them and express the interests, values and needs that they bring to the table. Instead of focusing on competitive measures and winning the negotiation, parties collaborate by looking to create solutions which maximise the meeting of all parties' interests, values and needs. This cooperative process focuses parties away from their positions and onto using interests and objective criteria for making decisions (Fisher, Ury and Patton, 1981).

When should parties use interest-based negotiation? (CDR, 1997)

- When parties have interdependent interests, desires and concerns.
- When it is possible to create integrative solutions which provide mutual gain for parties (win/win).
- When an ongoing relationship between parties is important.
- When parties need to switch from adversarial interactions to more cooperative ones.
- When there are principles (e.g. human rights standards) which parties are bound to uphold.

The interest-based negotiating process (adapted from CDR, 1997)

1. *Identifying substantive, psychological and procedural interests*
   What are the different interests that you are trying to meet through the negotiating process? Why are these needs important to you? Which interests are of greater/lesser priority to you? How can you communicate these needs and their importance to the other parties? Also try to determine the interests of the other parties? Why are they important to them? How do they prioritise their issues?

2. *Getting started*
   Instead of beginning with an opening offer as in positional negotiations, start with a period of time in which parties discuss the issues and educate one another on their interests, needs and concerns. Be explicit about your interests and those of the other parties. If other parties offer a position or solution, reframe it in terms of the interests they are trying to articulate.

3. *Managing the issues*
   Clearly state the issues. Frame them in ways which are acceptable to all parties. Avoid stating issues in win/lose terms or in ways which suggest a certain outcome. Order the issues. Is there a logical order? Are there issues which are easily resolved? Can certain issues be grouped together?

4. *Problem-solving and option generation*
   Jointly determine a strategy for problem-solving. Remind parties of the interests they and others bring to the negotiation. Generate options which will meet all or most of these interests. **Separate the generation of options from evaluating them.** Generate a range of options rather than focusing on one option at a time. Get parties to look at the problem from different perspectives.

5. *Evaluating options*
   After a number of options are generated, evaluate them. Look at how well they meet the needs of all the parties. If there is no clear best solution, get parties to look at integrating aspects of different proposals, find ways to "expand the pie", see if parties can make trade-offs based upon their priorities for settlement or reframe the issue.

Helping parties to move to interest-based negotiation

If parties are oriented to negotiate over positions, there are ways to help them make a transition to interest-based negotiation. Here are some of the ways this can be done (adapted from Fisher, Ury and Patton, 1981; CDR, 1997):

- If parties state a position on an issue, ask them why that position is important to them. Listen for the underlying interests, needs and concerns they use to construct their position.

- Avoid framing issues in win/lose terms or in ways which predispose parties to a certain solution.

- Separate the person from the problem—be hard on the *problem,* not hard on the *person.*

- Look for solutions which provide mutual gain (win/win).

- Educate parties on their interests — show them how certain solutions can increase their benefits.

- If your proposal is attacked, do not go on the defensive. Instead, ask why they feel the proposal will not work, again listening for underlying interests.

- Create general principles to guide the development of proposals and the decision making process.

- Identify areas of common ground.

- Avoid generating options and immediately evaluating them.

- Use objective criteria such as human rights standards to assist in evaluating options.

- Use impartial outside experts to evaluate options or educate parties about the ramifications of certain options.

- During the evaluation process, keep a number of options on the table and look for ways to integrate the merits of a range of options.

Source: Centre for Conflict Resolution, 2001, "Skills Development Training for Conflict Transformation" Conflict Resolution Manual. United Nations Department for Economic and Social Affairs, New York; pp. 33-54

MEDIATION

WHAT IS MEDIATION?

Mediation refers to a process through which a third party provides procedural assistance to help individuals or groups in conflict to resolve their differences. Mediation processes vary throughout the world in form and underlying philosophy. In many Western countries, the mediator is usually an independent, impartial person who has no decision-making authority. In other societies, it may be more important that the mediator is known and trusted by the parties to the conflict rather than being seen as impartial.

Mediation is a voluntary process and its success is linked to the vesting of decision- making authority in the parties involved in the dispute. The mediator structures the process in a way which creates a safe environment for parties to discuss the conflict and find solutions which will meet their interests. Mediation typically starts with an introduction which includes, among other things, a description of the process and ground-rules which provide behavioral guidelines for the participants. Parties are then, in turn, given an opportunity to present their understanding of the conflict. After this, a list of issues is created and an agenda is devised to guide parties through the resolution process. The mediator then helps parties negotiate solutions to the issues they have identified. As specific solutions are reached, parties are asked to confirm their acceptance.

Fundamental elements of mediation

The following elements distinguish mediation from other forms of conflict resolution:

1. **The process is voluntary**. Parties cannot be coerced into mediation and they may opt out of the process at any time.
2. **The mediator must be acceptable to all parties involved in the process**.
3. **The mediator offers *procedural* assistance rather than *substantive* assistance**. That is, the mediator controls the process of resolving the conflict while the content is the domain of the parties.
4. **The mediator must remain impartial**. That is, the mediator must be able to set aside his/her opinions on what the solution to the conflict should be. In addition, the mediator should be seen as neutral, in terms that she/he should not be in a position to benefit from continued conflict or benefit directly (in the form of some sort of compensation) from one of the parties.

5. **Potential solutions and decisions on agreements are determined by the parties to the conflict, not by the mediator.** While the mediator may suggest possible solutions, the parties decide what outcomes will best meet their interests. The mediator does not serve as judge or arbiter.
6. **Mediation is an interest-based method**, that is, it seeks to reconcile the substantive, psychological and procedural interests of the parties rather than to determine who is right or more powerful.

While there are various forms of mediation, some more directive than the above method, many peacemaking approaches are called mediation but do not meet all or even most of the criteria listed above. If a process is not truly voluntary or parties are coerced into decisions they would not make on their own accord, it is not mediation. This type of process frequently occurs in systems of violent conflict. While coercive methods may succeed in securing a settlement, it is unlikely that these settlements can be maintained over time without continued use of power. The long-term success of mediation is tied to the freedom given to parties to engage in the process and the authority that they grant to the agreement of their own making.

ROLES PLAYED IN CONFLICT SITUATIONS

From the pre-negotiation stage to the negotiation and post-negotiation stages, people involved in the intervention process play a number of roles. Local, regional and international governmental and non-governmental representatives may find themselves assisting peacemaking efforts in a variety of ways, including (adapted from Mitchell, 1993):

Explorer: Carries messages between parties and reassures them about the room for negotiation and notes areas of common ground.

Convener: Initiates the resolution process by encouraging parties to take part and working to remove obstacles which impede peacemaking activities.

Analyser: Performs political, social or economic analysis of the conflict to assist other intervenors in determining causes of conflict and courses of action.

Designer: Helps parties and intervenors in creating a resolution process which will appropriately and effectively address the conflict issues.

Communicator: Serves as the communication interface between parties involved in the process and those outside the process, such as the media, general public or international community.

Decoupler: Finds ways for external parties who have become involved in the conflict to disengage while saving face and attempts to engage other external actors who can play less biased roles in endorsing the process or encouraging parties to participate.

Unifier: Helps with intra-party negotiations to repair divisions and assists them in creating a common understanding of the conflict and their goals and objectives.

Enskiller: Empowers parties with the skills required to negotiate, communicate interests, analyse scenarios and research aspects of the conflict.

Educator: Provides expert opinion or technical information to parties about aspects of the conflict issues.

Envisioner: Helps parties think about the conflict and possible solutions in new ways by using creative option-generating processes or bringing in relevant data.

Evaluator: Helps parties assess possible solutions and their impact on the resolution of the conflict.

Guarantor: Ensures that parties do not incur unacceptable costs either through involvement in the process or if the process breaks down.

Legitimiser: Encourages parties to accept the process by granting their moral, political or financial approval.

Facilitator: Assists parties in communicating to one another by creating a safe process for discussions, framing or reframing the issues and parties' understanding of the conflict and fostering a forum for effective listening and problem-solving.

Enhancer: Brings in resources to expand the options for settlement or reward participation in the process.

Enforcer: Monitors agreements and codes of conduct so that momentum for the process can be sustained.

Reconciler: Prepares parties for long-term relationship-building activities which are designed to reduce patterns of negative behaviors, destructive stereotyping and miscommunication.

This extensive list of roles shows the complexity of starting and maintaining peace processes. The range of skills, knowledge, resources and aptitudes required to be effective in these roles is unlikely to be found in one person or intervening body. Whether by design or happenstance, when a number of actors are engaged in different aspects of intervention work, there are certain challenges which emerge.

For those involved in conflict resolution efforts, there are three central concerns regarding the roles of other actors. One is to ensure that the necessary roles related to each type of activity (e.g. convener, envisioner, or facilitator) are being filled. The second is to ensure that the roles that a specific actor plays do

not have conflicting principles and objectives. The third is to ensure that role players work cooperatively to achieve common goals.

Role Integrity

Role integrity relates to ensuring that when a person plays multiple roles, none of the roles compromises the others. Some roles operate on fundamentally contradictory principles. For example, one of the characteristics of the role of a third-party facilitator is impartiality. If the facilitator is also seen as an advocate or patron for a party to the conflict, other parties may feel that the process is biased. There are other role combinations, such as enforcer and reconciler, which can compromise an intermediary's credibility or continued participation. The central point is that individuals or organisations who are providing procedural or substantive assistance to the primary parties involved in the conflict need continually to assess whether the roles they are playing compromise their continued participation. When concerns related to the role players arise which threaten the process, appropriate action should be taken. This may include decoupling people from a given role or even removing them from the process.

Role Cooperation

When intervenors involved in various aspects of the conflict are not coordinating their efforts and, while their intentions may be good, their actions may impede or disrupt other activities. It is important for designers of a peace process to recognise that a number of people will be taking on different roles. The peace process needs to ensure that these people are aware of major events and decisions made by parties so that all people involved in the peace effort are working cooperatively towards common goals of peace, justice and reconciliation.

STAGES OF THE MEDIATION PROCESS

Stage 1: Introduction

Purpose

Remember that when parties arrive they are often:

- anxious and tense
- suspicious of the other party and their motivations
- fearful of being manipulated or taken advantage of
- unclear about what happens in a mediation session and what to expect from the mediators
- afraid that things will escalate out of control.

The purpose of the Introduction Stage is to deal with and allay these fears, in order that people feel comfortable to participate in and trust the process. The beginning of the mediation session affects the tone of the whole discussion. People usually agree to mediate because they hope that talking might improve things. Getting things off on the right foot in an atmosphere of negative emotions is a critical first step in mediating. Getting people to agree to meet and talk is itself a major challenge which we will look at later in the course. But for now we will assume that the 'getting to the table' discussions have already taken place and the parties have agreed to meet.

Remember that the Introduction Stage is your time - the rest of the mediation belongs to the parties. It is up to you to set the tone, be firm, direct the process. All of this will increase the confidence of the parties that their concerns will be taken care of.

Before parties arrive

1. **Check signals with co-mediator**
   - How you will divide tasks
   - Anticipate any special difficulties in this mediation situation
   - Cues during mediation. If necessary, offer verbal cues: "*John, would you pick it up from here?"* Or, *"John, could I bring up something here?"*

2. **Check environment:**
   - As comfortable as possible
   - Seating arrangements
   - A place for private meetings
   - Coffee, rest room, and smoking arrangements

Opening Statement

1. **Welcome and Introductions**

2. **How we will proceed**
   - Each person will describe situation uninterrupted from their perspective
   - Agree on what the basic issues of disagreement are
   - Discuss these issues one at a time

3. **Mediator's role**
   - To help parties find their own solution
   - Not to decide right and wrong

4. **Confidentiality and note-taking**

5. **Taking a break**
   - Parties can ask to take a break any time
   - Mediators may take a break and meet separately with each party (caucus)

6. **Ground rules**
   - Parties agree not to interrupt when other party speaks
   - Other ground rules
   - Can parties agree to this?

Before the session begins check the environment

- Arrive at the agreed meeting place well in advance of the parties. This gives you time to think through and check.

- Wherever possible, choose a space that is comfortable and supports good interaction. Remember that a room that is too big makes people just as uncomfortable as one that is too small. Think critically about your choice of venue even before you propose a mediation.

- Decide where people will sit in relation to each other and the mediator/s. The arrangement of the seating is also crucial. In order to create an atmosphere of openness etc., use a circle or triangle seating plan. No arrangement is "right" for all situations or cultures. What is important is that mediators consider how to adapt the space they are using to support the purposes of the meeting.

- Ensure where possible that there is a room for private meetings (see caucus)

- Plan arrangements in advance for toilets, smoking, meals, and tea or coffee if desired

- Decide how to greet people as they arrive.

Be 'in charge' from the moment the parties arrive so there is no question that the mediator is in control. Mediators should decide in advance who will sit where, and when the parties arrive show them where to sit. Mediators should also think through how to make introductions, and how to begin the session. Later in the mediation process, if things are going well the mediators can reduce their level of control, but in the beginning, it is reassuring to the parties to see that the mediator is clearly in charge. From their perspective at this point, mediators clearly in control of the situation are their only protection from chaos.

Introductory comments

Many mediators find it useful to develop a standard outline of things that need to be said in the opening minutes of a mediation session. But what and how will depend on the circumstances. It is important that whatever mediators say fit the situation. Here are some of the things often included in the mediators' opening comments.

1. **Welcome and Introductions**
   - In some cultural settings this phase would be handled in five minutes. In others, socialising would be an important part of getting started and might last much longer.
   - It may be helpful to clarify how people wish to be addressed. By first name, last name, title? If there is uncertainty, one way to deal with the question is by indicating how you would like to be addressed and asking parties to say how they would like to be addressed.

2. **How we will proceed**.
   To give a simple outline of the mediation process may help to put parties, who may have little idea what happens in a mediation session, at ease.
   a Each party will be asked to **describe** the situation uninterrupted as they understand it.
   b We will together **create a list of the issues** for discussion.
   c We will then **discuss** these issues, looking to generate potential solutions.
   d We will try to work out an **agreement** that is acceptable to both/all parties.

3. **Mediators' role**
   Parties often arrive expecting the mediator to be an arbitrator or judge, determining who is right and making decisions for the parties. Mediators provide procedural assistance to parties in conflict. It helps to clarify this role:
   - Mediators help parties find their own solutions.
   - Mediators do not to decide who is right and who is wrong.
   - Mediators do not determine what the outcome will be.

4. **Confidentiality and note taking**
   It is important to indicate to parties that any notes that you as the mediator are taking are to assist you to keep track. The notes will remain confidential and they will be destroyed after a settlement is reached.

5. **Taking a break and caucusing**
   In order to keep parties fully informed about the mediation process, it is important to let them know that breaks may be called by the parties or mediators. Explaining this ahead of time prevents the raising of suspicion when a break is requested. Note that:
   - parties can ask to take a break at any time
   - mediators may sometimes call for a break in the proceedings
   - mediators may also ask to meet separately with each party (caucus).

6. **Ground rules**
   When tension is high, mediators often propose ground rules and ask the parties to commit themselves to them: for example, not to interrupt when the other party is speaking. If you use this or any other ground rule, it is most effective if you specifically ask each to commit themselves to it so that they 'buy in' to the process. It is also effective to ask the parties if they have any ground rules that they would like to add.

An example

The mediators meet the parties at the door, show them where to sit, and exchange appropriate greetings. Then the first mediator begins:

"The purpose of our meeting this evening is to discuss the problems that have arisen between the two of you and to try to work out a solution. I want both of you to know that we have a lot of respect for your willingness to sit down and talk things out face to face like this. First, we would like to explain how we will proceed, so you know what will be happening. We will begin by asking each of you to describe the situation as you understand it. This will be a time for each of you to explain without interruption to us as mediators exactly how you view things. We will do our best to understand how it looks from your point of view. After that, we will try to make a list of the issues of disagreement. Then we will work together to examine exactly what each of you needs to solve this situation and what your ideas for resolution are. The goal is to find a solution that both of you can accept."

(By pre-arrangement, the second mediator picks up from here): *"We would like you to understand our role. We think it is important for you to sort out your <u>own</u> solutions to your problems. <u>You</u> are the ones who are involved, so we want you to be the ones who decide what the solution will be. We won't be judges saying who is right or wrong or telling you what the solution must be.*

Last of all, there is one ground rule that we would like to ask each of you to agree to, and that is not to interrupt when the other person is speaking. This is

especially important in the next part of our discussion. Mr. East, can you agree to observe this ground rule?" (Waits for a response) *"Ms. West, can you agree to observe this rule?"* (Waits for a response)

The first mediator continues, moving to "The Conflict Description Stage": *"We'd like to begin now by inviting each of you to explain your perspective on this situation uninterrupted. Mr. East, will you begin? Ms. West, we will ask you to listen along with us now as Mr. East speaks. In a few minutes it will be your turn. Mr. East, you can go ahead and begin now."*

Stage 2: Conflict Description

Purpose

The Conflict Description stage presents an opportunity for the mediator to begin to understand the perspective of each party, and to start formulating in his/her mind, the crucial issues that need to be addressed, and a way to proceed. Even more importantly, through communication skills such as active listening, the mediator allows parties to feel that they have been heard, and assists parties to hear each other - sometimes for the first time. This represents a turning point in many conflicts, for parties who have not understood the effect of their actions on others, and have not been able to express what they in turn have been feeling.

Process

1. Each party explains the situation from their perspective while the other party listens.
2. Mediators summarise briefly and empathetically as each party finishes, reflecting facts, feelings, interests and needs.
3. Mediators may ask, or invite other parties to ask, questions to clarify various points.
4. The mediators identify and list issues.

Notes

1. **Rapport:** Building rapport with both parties is the primary goal here. Grasping facts and chronology is important but secondary.

2. **Paraphrasing:** This is a powerful tool for building rapport with many, but not all people.

3. **Questions:** Be careful with questions since they impose your agenda on the speaker (leading), rather than allowing the speaker's experience to structure interaction (pacing). Wait if you can. If you must ask questions, phrase them as open questions, not closed questions.

Open questions:

"Say more about Mrs Jones.", "Tell me your memories of that event.", "Describe, clarify, expand, etc."

Closed Questions:

"Who is Mrs Jones?", "Who, why, what, etc.?"

4. **Interruptions:** Be firm with parties about not interrupting the speaker. Respond to the first few and ignore later ones, not the reverse. Give them paper and pencil to make notes if they feel a need to respond to a specific point.

5. **Barbed comments:**
   a Be prepared to say to someone listening to an angry account from an opponent: *"John, I know you have a different perspective and I want to hear your view as well in a few minutes."* Offered as an occasional aside to listening parties, such a comment by mediators can help them to keep growing anger under control.
   b Launder with neutral paraphrase, e.g.: launder *"she's lying"* into *"you see things differently".*
   c Ask for specific examples., e.g.: If party says "*he's incompetent and totally irresponsible,"* mediator says "*please give us a specific example of what you have in mind."*

6. **Writing up the issues:**
   - it is preferable to have one common list
   - condense issues if possible
   - wait until both parties have had their input before putting up a visual list
   - frame issues carefully to ensure that they are acceptable to all parties.

Stage 3: Problem-solving

Purpose

The Problem-solving stage is the most challenging part of mediation, for it is now that the first serious efforts at resolution are made. Although we propose a sequence of activities that will give you some idea of things that might take place, there are no rules about how to go about this stage. The key to managing the problem-solving stage are:

- **people/relationship-building skills**, tools that enable the parties to establish a human bond between them. i.e. communication skills
- **process-management skills,** e.g. maintaining control, breaking impasse, and managing the flow of communication

- and **problem-solving skills**, that is, tools for enabling the parties to discuss the problems that separate them in a way that is efficient and constructive, using good timing in switching from one to the other. Thus you need to create a simple framework for yourself, and to master the use of the key tools, to be able to use them skilfully in real life, according to the dynamics of the conflict you face, the cultural setting, and the parties involved.

Process

Two basic tasks occur in this stage — working with problems through rational efforts at problem-solving and negotiation, and working with people — through good listening and skill in handling bruised feelings.

Suggested sequence

1. List issues for parties to see

2. Point out commonalities
   - common frustrations
   - common commitments
   - inter-dependency
   - common good intentions, even if outcome has been unsuccessful — try to find something positive to highlight, but make sure it is believable.

3. Generate ideas to resolve the issues. It is often helpful to structure option generation by focusing on one issue at a time; however, there are situations where it is more constructive to group similar issues together and discuss them as a block.
   - Use the Conflict Description format for each issue
   - Continue with standard problem-solving approach:
     a. identify interests/needs
     b. ask for ideas to resolve
     c. evaluate ideas
     d. choose and plan implementation

4. People skills used throughout
   - attentive listening
   - highlight commonalities and good intentions
   - acknowledge feelings
   - coach direct dialogue and paraphrasing
   - draw people out in caucus
   - affirm parties and celebrate progress

Clarifying the issues

One of the most useful contributions of mediators is to clarify the issues in conflict. This is often first done after each party has told their side of things in Conflict Description, as a way of focusing the discussion that will follow in the problem-solving Stage. By clarifying the issues, the mediation process can be improved in several ways:

- Often parties are themselves confused about what the conflict is actually about. Party A may think one problem is the cause Party B may think a different problem is the cause.
- Frequently parties think that their divisions are greater/more numerous than they actually are. Clarifying the issues may help make the conflict seem more manageable. "*I was surprised when you made that list on the board."* a party once commented near the end of a mediation session, *"Before we started it seemed like we had more than three issues between us."*

It is difficult to maintain control of the discussion if the parties have not agreed to a list of issues for discussion. Having a written "agenda" of issues is the mediator's most powerful tool in establishing an atmosphere of impartiality and maintaining control over the discussion process. Not having a written agenda increases the risk of parties simply bouncing from one issue to another, trading accusations but never penetrating deeper to the underlying needs.

Listing the Issues

One of the mediator's most useful tools for maintaining control is listing issues on a flipchart or overhead transparency at the beginning of the Problem-Solving Stage. This provides a visual agenda and makes it easier to keep the discussion focused. Create a list of the issues needing work and interact with it. Use it to list commonalities and options for resolution.

Visual lists:

- help people feel heard so they don't need to keep driving home their point
- create a sense of order
- help parties focus on a common problem rather than on each other
- can provide guidance when you need to change direction

It is preferable to form one list of problems to reinforce the awareness that this situation is a shared problem requiring joint effort to solve. If you are working with parties to develop a framework for trade negotiations (sometimes referred to as 'talks-about-talks') a partial list of issues might look like this:

-venue selection
-dates for negotiations
-invitations
-seating arrangements
-trade issues to be discussed

Remember to describe the issues impartially

Either way, mediators must at all times take care to talk about and write issues in words that are impartial and convey no sense of judgement or taking sides.

Determining Agenda Order

After the parties have agreed to a list of issues, mediators face a strategic choice: Which issue to begin with? There are a variety of ways to make this decision. Regardless of how you make the decision, no one party should be allowed to make the decision about which issue to begin with as this may create the impression that the mediators have given up control of the process to one side. The decision should be made by the mediators or jointly with the parties.

Possible Strategies

1. **Rank by Importance.** Parties pick the two most important issues and begin discussion on these. When completed, continue with the next two. Effective when atmosphere is good, but difficult when tension is high.

2. **Easiest First.** (In terms of time, emotional intensity, 'risk' to parties etc.) Beginning with the easiest issue is probably the most commonly used strategy for deciding where to start. Can be useful when things are tense. Often success on small items creates momentum for larger ones and makes discussing other items easier.

3. **Most Difficult First.** (In terms of time, emotional intensity, 'risk' to parties etc.) If an issue seems the most pressing/crux of the conflict, and parties have a need to deal with this issue in order to be able to focus on others, it is important to deal with it first. If you get resolution on this issue, it creates a clear sense of progress. Often other issues fall away, having been mentioned to add weight to the main problem.

4. **Separate Long-term from Short-term Problems.** Then begin with whichever list seems most resolvable, usually the short-term.

5. **Alternating Choice.** Parties take turns picking issues for discussion.

6. **Principles First.** Parties begin by agreeing on a set of criteria about any potential agreement. E.g.: *"We agree that the ideal solution would:*
   (a) enable both parties to continue as partners in the firm;
   (b) keep budgets at current levels of expenditure;
   c) be consistent with current company policy regarding lateral moves."
   This strategy is particularly effective in complex disputes.

7. **Building-Block.** Issues are dealt with in a logical sequence by determining which issues lay groundwork for decisions about later

issues. E.g.: "*We'll begin with the issue of job description since the issue of salary level depends on what the job description is."*

Point out commonalities and points of agreement

People in conflict often get so caught up in the heat of disagreement that they often lose perspective and ignore the things they actually agree upon or share in common, or even their common history. Mediators can be a moderating force by repeatedly reminding people in conflict of these things.

1. *Pointing Out Commonalities in Early Problem-Solving:* One particularly effective time to summarise points of agreement is after the parties have agreed on the list of issues needing discussion, but before they have actually begun in-depth discussion. It is possible in almost any conflict situation to find points that the parties share in common:
   - They may both have stated a desire to be reasonable or to get the conflict resolved.
   - They are both likely to benefit a great deal from a resolution of this conflict.
   - That they have both been willing to attend this mediation session means that they haven't yet given up on this situation and probably indicates a desire to resolve things.
   - They may both have said that this conflict has been painful, frustrating, costly, etc.
   - They may both have talked about how committed they are to the other party or the mediation process.
   - They may both have talked about steps they took in the past to resolve things. Even if these failed, they indicate good intentions to work things out.
   - They may both be victims of the same larger forces, such as racial/ethnic tension, financial constraints, violence, etc.
   - They may both have indicated that they have made mistakes or over-reacted in the past.

   It is possible to identify several areas that the parties agree upon or share in common, even in the most polarised conflict. Pointing these out repeatedly throughout the discussion process is an important contribution to the emotional atmosphere of discussion.

   Be cautious! Remember that pointing out commonalities is not about:
   - making up nice things that aren't true. Be sure that any commonalities you talk about reflect things the parties have already said or have agreed upon or that are obviously true.
   - telling the parties that they don't have any real disagreements or that the disagreements aren't significant. At all times the mediator accepts that there are real conflicts. In pointing out commonalities you are merely pointing out that in addition to the areas of conflict, there are also some things the parties agree about.

- suggesting that resolution is going to be easy. On the contrary, the point is that there is hard work ahead, and that as they enter into this work, it would be helpful for the parties to remember those things that they share in common.

Your credibility as a mediator is probably your most important asset with the parties. Never lie; never exaggerate the prospects for peace. Whatever you point out has to be real and believable.

2. *Summarising Negotiated Agreements:* As the negotiations continue, it becomes increasingly easy to point out agreements. The mediator can now summarise the agreements that have been worked out in the current mediation as a way of establishing a positive atmosphere. By reminding the parties of what they have accomplished, the mediator can thus discourage them from falling back into attacks and recriminations.

Some Typical Problem-Solving Sequences

Classic Problem-solving

1. Define the problem.
2. Generate as many options as possible for resolution
3. Evaluate the options
4. Pick the best.
5. Develop implementation plan

Principles first

1. Identify the problems each is facing
2. Agree on the principles each side could support
3. Work on the specific implementation of the principles in the problem areas
4. Devise a clear implementation plan

Future First

1. Define the present state - describe as specifically as possible what is happening now
2. Develop a desired future state - describe the kind of situation or relationship you would like to exist
3. Create a list of possible strategies to reach the future state
4. Analyse the responses
5. Select the best response
6. Specify steps to implement

Joint Education/Problem Definition

1. Identify in broad terms the issues needing resolution
2. Joint education and data gathering concerning the issues
3. Develop problem statements -- for each issue create several problem statements that describe non-judgmental and specifically the problems that need to be addressed in resolving the issue or describe the needs that motivate each party concerning each issue
4. Identify options to resolve
5. Develop recommendations

Criteria First

1. List problems/issues
2. Develop a list of criteria that an acceptable solution must meet (or go straight to 3)
3. Generate a list of possible solutions
4. Evaluate each solution in the light of the criteria
5. Choose the best solution
6. Develop implementation plan

Focus on Interests

1. List problems/issues
2. Choose one and ask for ideas to resolve it
3. Whenever there is difficulty, ask each party to clarify their concerns (identify the underlying interests
4. Work through the list of issues one at a time, and develop an implementation plan

Caucus

Caucus is a private meeting between the mediator and only one party. To keep things balanced, mediators caucus with both parties separately. Caucus is a useful tool, since dealing with one party at a time is simpler than with two or more in the same room. When things get tense or difficult, caucus is one easy way to maintain a sense of control. When all else fails, caucus!

Some mediators do most of their work in caucus, conducting 'shuttle diplomacy' between the parties. This can, however, cause suspicion. Then too, caucus does little to empower the parties to solve their own conflicts themselves, for the parties depend entirely on the mediator to work out the differences. Direct dialogue between parties is always preferred, but private caucus is sometimes needed to break a deadlock or deal with emotional or confidential issues. Caucus is a powerful tool for dealing with problems, and in volatile or sensitive disputes it may become the primary means of communication.

Call a caucus when:

- Parties are deadlocked.
- High stress is getting in the way of communication (repeated breaking of ground rules, disruptive behaviour, indications of distrust of you or the other party, repeated expressions of emotion).
- Parties are making unrealistic proposals or concessions.
- You feel you are losing control of the process or grasp of the facts.

Steps to follow when caucusing

1. **Indicate you want to meet separately with parties, and that you'll meet with them in turn.**

2. **Establish rapport with the party you're with**
   - Ask: "*How do you feel about how it's going so far?"*
   - Note positive accomplishments e.g. areas of agreement, helpful behaviours/contributions
   - Allow venting of strong feelings and sensitive information through active listening

3. **Take the role of "concerned outsider" regarding the areas of deadlock, e.g.:**
   - *"Clarify for me again your stand on this..."*
   - *"Help me understand your major concerns..."*
   - *"What ideas do you have to resolve this?"*
   - *"Can we come up with something acceptable to both of you?"*

4. **As much as possible get the parties themselves to come up with ideas,** but if they come up with nothing, toss out ideas in **"if-then"** or **"what if..."** format, e.g.:
   - *"If he were to do X, then might you consider Y?"*

- *"What if we were to agree that...?"*

5. **If necessary, take the role of "reality tester**", e.g.:
   - "*How do you think the situation will get resolved if both of you continue to take this position?"*
   - *"What are the costs of not resolving this likely to be?"*

6. **Suggest expanding the party's informational resources if needed** - attorneys, accountants etc.

7. **Get permission to convey important information or proposals to the other party,** e.g.: "*Is it all right for me to discuss your offer with the other party?"*

   But, when you discuss an offer from one to other don't convey it as unilateral. Rather link it to something wanted by Party A from Party B, e.g.: "*Party B, if we could get A to agree to give you X, would you be willing to consider offering in exchange Y?"*

8. **If you secure agreement from both parties to a proposal in caucus, then bring them back together and repeat the agreement in the presence of both,** e.g.: "*Well, we've made some real progress regarding issue Z. Party A, you've agreed.... Party B, you've agreed..... I'd like to ask you both to confirm in the presence of the other that you support this.... Let's now talk a little more specifically about how we will implement this agreement...."*

An Example - Setting up and using caucus

"I'd like to take a break now and meet separately with each of you. We call this caucus; it's a time just to talk about how things are going and see whether we can come up with new ideas for resolving things. I'd like you to know that whatever we discuss in this caucus is confidential and I won't be sharing it with anyone else unless you give me permission to do so. Party A, perhaps we'll begin with you..."

Party B leaves the room and the mediator begins the caucus: *"Well, Party A, how do you feel about how things are going?"'*

The mediator wants to discuss one issue that has caused special problems. S/he says, "*Tell me a little more about your concerns regarding Issue X?....What are the things that are most important to you here?....Do you have any ideas that we haven't discussed yet for resolving Issue X?....What do you think will happen if we don't get this issue resolved today?....How do you feel about that?....Is there any other way we can solve this?*
Supposing we could get Party B to do..., would you consider doing...?"
During the caucus Party A makes an offer to resolve the conflict. The mediator seeks permission to discuss this offer with Party B: *"Would it be all right if I mention this to Party B?"*

The mediator then meets with Party B and asks similar questions. S/he is cautious with the offer from Party A, and mentions it in general terms only after Party B also makes a related offer. "*Party A is indicating some flexibility on this issue as well. I think if you were prepared to make this offer we've just now discussed, that Party A would respond positively. Would you be willing to discuss this jointly with Party A?...*"

Back in joint session with the two parties, the mediator says: *"Well, both of you have indicated some flexibility regarding Issue X, and I'd like to have some joint discussion on this now. Party A, you have indicated flexibility regarding..., and Party B, you have suggested.... I'd like to give each of you a chance to respond to this now..."*

Stage 4: Agreement

Purpose

The purpose of the Agreement Stage, is to concretise the outcome of the problem-solving stage, and to ensure that any agreements reached are clear, specific, realistic and proactive.

This stage is one of the most critical phases of the mediation process. Strong temptations often exist to relax a few minutes too soon, but this can be very costly. One common cause of failure in mediation is that mediators and parties neglect to work out the details and procedures for implementation of agreements. The result: days or weeks after an apparently successful settlement, renewed conflict breaks out over the meaning of the original agreement. Sometimes this conflict can be resolved with another round of mediation, but all too often the agreement breaks down entirely, with the parties bitterly blaming each other for failure to keep promises. Peace may now be harder to achieve than ever. By staying on guard to the very end, mediators can greatly reduce the chance
of such a scenario occurring.

Process

The agreement should state clearly **WHO** is agreeing to **WHAT, WHERE, WHEN** and **HOW**. The disputants' wording can be used whenever possible. An effective mediation agreement should:

1. **Be specific**
   Avoid ambiguous words (e.g. 'soon', 'reasonable', 'co-operative', 'frequent') as they can mean different things to different people. Use specific words and dates that will have the same meaning to both parties. For example, "*Party A agrees to a 60-day moratorium on development of mining operations on the border of the national park."*

2. **Be clear about deadlines**
   State clearly all times and deadlines. For example, "*The environmental task team has until 30 June 1997 to perform an EIA. Both parties will have until 10 July 1997 to review the study."*

3. **Be balanced**
   Everyone should 'win' something, and agree to do/not do something. For example, "*Party A agrees that... Party B agrees that..."*

4. **Be realistic**
   Can the disputants live up to their agreement? Ideally the agreement speaks only for the disputants themselves, i.e. actions over which they personally have control.

5. **Be clear and simple**
   When possible, use the disputants' language. While agreement details are very important, making agreements too complicated can lead to misinterpretations or misunderstandings which create further conflict.

6. **Be proactive**
   Include provision for later review, or set up a monitoring mechanism, or agree on a procedure for dealing with problems that may arise.

7. **Be signed by everyone present**
   Upon completion read to the parties and get their responses. Does it cover all issues? Do they pledge to live up to it? Should we agree on some way to review progress in the near future? Then sign and date the agreement and give copies to both parties.

CULTURAL ASPECTS INFLUENCING CONFLICT RESOLUTION

Culture plays an important role in how we view conflict and how we approach it. Here are some of the ways that culture influences the conflict resolution process (CDR, 1997):

1. *Approach to conflict.* What does your culture tell you about how to deal with conflict? Is the message to avoid conflict, accommodate the other party or attempt to 'win' the conflict? What are the messages you receive about compromising your position or collaborating with the other party?

2. *Approach to problem-solving and agreements.* How do people conceptualise problems? How does this influence the problem-solving process? Are differing values attached to verbal and written agreements?

3. *Relationships.* How are relationships built in your culture? Are relationships in a social setting built differently than in a business or political setting? How

do people attain status in your culture, through age, race/ethnicity, gender, knowledge, experience, wealth, etc.?

4. *Time.* What is the cultural impact on time as it relates to conflict? Do you deal with conflict straight away or do you let tensions dissipate before attempting to resolve it? When parties are describing their understanding of the conflict, do you control the amount of time they have or let them speak until they are finished? Do you use time to put constraints on the resolution process?

5. *Space.* What are the cultural views on space? Do disputants like to be far apart or close together? Are there other people around them? If so, how close are they? Where do the disputants come together to discuss their problems? Do they meet on neutral ground or on one party's 'turf'? Do they prefer the setting to be formal or informal? Is the conflict resolution setting open or closed to people not directly involved in the conflict?

6. *Impact of social structures.* What are the larger social structures and institutions which influence conflict? Are there religious, ideological or familial structures which are important? How do they tell the disputants to act in a conflict situation?

7. *Communication.* Is communication direct or indirect? Are disputants using a common language? What effect does an interpreter have on communication? Do disputants speak directly to one another or through a third person? Which non-verbal cues or gestures are used and to what effect?

8. *Intervenors.* What are the cultural views on intervening in conflict? Are there structures in place for people to use to resolve conflict? Who are the intervenors and what qualities do they possess (e.g. age, gender, expertise, status, etc.)? What is the role of the intervenor?

CONVENING MULTI-PARTY STAKEHOLDER NEGOTIATIONS

When conditions in a conflict ripen to a point where parties are willing to consider opening lines of communication, intermediaries perform a number of tasks in preparing to bring parties together. They usually start with an analysis of the conflict which is used to help identify stakeholders, issues, process options and a time table for the negotiating process. The dynamic nature of conflict systems means that, especially at the beginning, these activities may need to be repeated. Intermediaries should allow time for the process to move forward in a way which permits them to uncover additional stakeholders and issues which will become part of the ensuing stages of negotiation.

For intermediaries, understanding the conflict and identifying stakeholders are the first steps in the process. Conflict analysis is used to uncover these additional parties so that the reconciliation process does not unravel at a later stage due to an incomplete understanding of the extent and nature of the conflict. In the conflict analysis phase, intermediaries research information on the conflict through the media, reports, documents and by interviewing stakeholders. The objective of this research is to identify (see *Conflict Analysis* in Section 1 for more detail on each aspect of the analysis):

- **Historical issues**
- **Conflict context**
- **Parties**
- **Issues**
- **Bases of power**
- **The stage of conflict**

While media accounts and other documents are important resources for conflict analysis, interviews with stakeholders are necessary for reasons other than just providing data about the conflict. Interviews also:

1. Provide parties with contact to the intermediary, giving intervenors the opportunity to build trust and to establish credibility in the resolution process.
2. Can be used to condition parties for negotiating with one another, noting why resolution of the conflict is important and what they need to do to prepare themselves for negotiations.
3. Help identify areas where more information or resources are needed to assist parties in resolving their differences. This may include educating parties about certain legal or technical aspects of the conflict or negotiating process.

Preliminary Process Design

Through this iteractive process of identifying stakeholders, building a list of issues and analysing the conflict, intermediaries start to develop a preliminary process design. This design should meet the procedural, psychological and substantive interests of the parties. A strong process design will address the following concerns and questions (adapted from CDR, 1997):

- *The format of the negotiating process.* What is the design of the actual discussions? How will parties address the issues? Which procedural options will be used to manage the agenda?

- *Where the negotiations will take place.* Should they take place within the system of conflict or outside? Should they take place in one party's stronghold or at a neutral site?

- *The timetable for the process.* How much time is needed for an effective process? What will be the effect of too little time or too much time?

- *Who will be directly involved in this process.* Who is directly impacted by decisions made about the issues to the conflict? Who has decision-making authority within the primary parties? Who can make or break agreements of the negotiating forum? When there are large numbers of parties, how do you structure representation for maximum participation and a workable process? How do you structure participation to deal with the possibility that a party's representative may be unable to attend every session?

- *How other parties will be informed about the status of the negotiations.* If all parties are unable to sit at the table, or if secondary parties need to be apprised of developments, what structures should be put in place to ensure that relevant information is communicated in a clear and timely manner? How will you ensure that confidential information is not leaked?

- *The issues to be addressed.* What is the scope of the process? That is, what do parties feel should be addressed by this negotiating forum and which issues are off limits?

- *How will decisions be made and what is the authority of those decisions.* How will parties in the negotiating forum make decisions: voting, consensus, modified consensus? Are decisions of the forum binding on all parties or subject to approval by constituencies not at the table? How will deadlocks in the decision-making process be handled?

- *What will you do if stakeholders opt out or walk out of the process.* What will the forum do if certain parties opt out or walk out of the process? What impact will this have? Are there mechanisms which could be put in place to deal with this potentiality?

- *What will you do with unidentified stakeholders who emerge later in the process.* If this occurs, how will the process handle this? What will you do about decisions already made which affect this party? If necessary, how will you prepare them to join the process?

As this preliminary design takes shape, the stakeholders need to understand and agree on the form and content of the process. During the phase of preparing parties for a particular process design, intermediaries often need to identify people within the system of conflict who can champion the peace process (Moore, et. al., 1992). These champions are typically influential people who have either high credibility and integrity, or have the authority to encourage parties to participate. At this stage, the goal is to obtain a formal commitment from the parties to engage in the resolution process.

B 4.4

Collaborative decision-making; including gender aspects

Code	B 4.4
Teaching topic	Collaborative decision-making; including gender aspects
Time (hrs)	1
Content/Skill focus	Collaborative decision-making, including gender aspects
Objectives	To make participants aware of their own decision-making attitudes and practices
Learning methodology	Debriefing
Trainer/facilitator guide	On the basis of the role-play in 4.6, allow groups to reflect critically on how decisions were made in their groups and what role gender played in decision-making.
Course book	

B 4.5

Teambuilding / Role clarification

Code	B 4.5
Teaching topic	Team building / role clarification
Time (hrs)	2
Content/Skill focus	Negotiating team functioning and role aspects.
Objectives	To learn lessons from negotiation teamwork. To enhance awareness of team requirements and qualities in a negotiating setting. To further understanding of team roles and practicability from a functional and tactical perspective.
Learning methodology	Guided debriefing in plenary setting. Participants share experiences and receive theoretical background. Plenary discussion; share experience.
Trainer/facilitator guide	- Focus debriefing from role play by teams through use of a checklist of main elements of teamwork. - Facilitate additionally a sharing of participants' past experiences in negotiating teamwork: lessons learned. - Introduce and discuss theory of team formation, team requirements and development from a management perspective. Link discussion to lessons learned. - Focus the discussion on the basis of a general process overview and register good practices. - Address aspects of organisational cultures.
Course book	Jan Peter Dijkstra: "Teambuilding/Role clarification"
References	"Negotiation", R.J. Lewicki, D.M. Saunders & J.W. Minton, International Editions 1999 "Cultures and Organisations: software of the mind", G. Hofstede, 1991 "Power in and around organizations", H. Mintzberg, 1983.

Teaching topic 4.8: Guided debriefing – Teambuilding/Role clarification

Teambuilding/Role clarification

Jan Peter Dijkstra, CATALIC

Background

Teambuilding is a prominent subject in organisation and management literature and is attracting a lot of attention in organisations and businesses as a tool for improving team performance. The human resources training market offers a wide variety of products for teambuilding, ranging from methods that are oriented on the improvement of individual skills to unconventional programmes of teambuilding outside the work place.

Dealing with teambuilding requires both awareness of what it is that makes a team work and which individual qualities may add to the success of teamwork. Research has produced many workable categorizations of team roles and role functions in a group. One of the most widely known models of effective teams and their roles has been developed by Belbin [1)].

The identification of roles, for example through assessments, give important indications as to the preferred and performed roles of individual team members. It assists in identifying what roles people (could) perform "naturally" when they work in a team. In these roles there are a set of positive and negative aspects. It also assists in identifying strengths and weaknesses of the individual team members and consequently for team as a whole. The improved insight of a teams' strengths and weaknesses offers a point of departure for role distribution (and role flexibility) and provides the team with indications on what additional qualities may still have to be catered for.

The aforementioned team roles should be distinguished from team roles as used for description of negotiation tactics, like the "good guy" and the "bad guy". There is however a common element between team roles of the behavioural type and tactical team roles, that is the specific qualities of the individual that make him or her strong in a specific role or weak if the role is not in line with a persons strong qualities.

Qualities or core qualities are a basic tool in competence based management. One of the advantages of this approach is the common language it provides when developing and applying instruments of human resources management in organisations. This is being used in competence profiles for functions and staff members, assessment, training, evaluation of individual performance etc. Organisations that are using instruments of competence based management may find it easier to asses needs of teams as individual staff are already measured against that yardstick.

In the context of negotiation teams the awareness and the knowledge of team requirements and individual qualities that can contribute to the effectiveness of a negotiating team, is critical in enhancing their performance. One of the purposes of this course element is to enhance this awareness.

As is the case with teambuilding in management, there is no general recipe. Requirements of negotiating teams should always be considered in the context of the negotiation in question. Given the dynamic nature of most negotiations in their various stages, the influence of wider external contexts (political, legal, cultural, ideological etc.), effects of behaviour of other party and other variables, there is a need for flexibility, not only in strategy and approach but also in terms of team composition or role assignment.

Negotiating teams representing governmental institutions are usually composed of those who have a formal functional position in dealing with the substantive question. These persons may not always have (developed) all the qualities that are required for effective negotiating or for a specific type of negotiations in a particular setting. It is therefore important to look critically at team aspects before entering into negotiation and to evaluate the effectiveness of the team during its work.

Main subjects that deserve consideration when building a negotiation team:

<u>The composition and formation of negotiating teams and the selection of its members</u>

Institutional aspects
- Clarity about leadership role
- What are selection criteria
- Are the main stakeholders represented on the team, directly or indirectly
- Are the right advisors on board
- Is their sufficient supportive capacity in the team or on site for adequate functioning of the team

Individual aspects
- Availability of the key participants
- Awareness of perceptions, stereotyping, halo effects
- What are individual expectations, motivation and interests

<u>The team requirements in terms of knowledge and the qualities of individual team members</u>

Assessment of team requirements for the (prospective) team
- **Knowledge – key disciplines represented; wide spread working knowledge of relevant variety of disciplines present**
- **Skills – consider and define function/tasks requirements; roles requirements; communicative skills; consider available individual (teamwork)qualities and special talents; distribution of functions/responsibilities/tasks/roles/role function**
- **Attitudes: consider personal qualities and styles**
- **Evaluation of team members' qualities (easier if a line authority can be exercised): self analysis-understanding own behaviour / behavioural patterns in communication and interaction (Rose of Leary)/(multiple)quality quadrants / 360-180-degrees feed back / assessments in preparation of additional training-skills improvement etc.**

FORMAL TEAM FUNCTIONS	TEAM TASKS
Chair person	Consulting/Negotiating / Mediating
Delegation leader	Initiating / Creating
Deputy del. leader	Presenting
Advisor	Advising
Expert	Lobbying
Note taker	Networking
Secretary of delegation	Drafting
Observer	Reporting
Spokesperson	Etc.
Etc.	

TEAM ROLES **(Belbin types)**	TACTICAL ROLES
Coordinator	Hard Liner
Monitor/Evaluator	Sweeper
Resource Investigator	Good Guy
Shaper	Bad Guy
Specialist	Leader
Team worker	
Plant	
Completer	
Implementer	

QUALITIES: ATTITUDE (a selection)**	Integrity Open minded Committed Sensitive Realistic Balanced Respectful
CAPABILITIES: KNOWLEDGE	Main (multi) sector (IWRM) issues and key negotiating issues The broader national and international context (legal; economic; environmental; social) Relevant regional relations and institutional frameworks Negotiation theory Cross cultural communication
QUALITIES: SKILLS (a selection)**	Communicational (broad spectrum ranging from relational, presentational to discussion skills) Negotiation Cross cultural Strategic and analytical Collaborative Initiative Conceptual Flexibility Creativity Tenacity

*Illustrative list of qualities in separate handout

Opportunities for team building

- Awareness of possible scope for and limits to team building
- Seek informal (bilateral) contacts with team members
- Use preparation meetings involving prospective team members to build commitment
- Formal team meetings, including first official delegation meeting: discuss expectations, possible differences of view; set and maintain direction and nurture team spirit and cohesion; agree on working procedures and communication; create a safe, supportive and inspiring work environment (soft side of the work: process/interpersonal communication/code of conduct)
- Agree on functional evaluation and feed back (giving direction via appreciation/correction) as to team and individual performance; consider to use observers/advisors as part of team as soundboard
- Consider how to deal as a team with success and failure
- Informal gatherings: blow of steam and relax; take care of personal relationships

(Cross) cultural aspects

- Impact of national and organisation cultures on negotiation behaviour
- Impact of perceptions of culture(s) of other party on negotiation behaviour
- Possible consequences of (cross)cultural aspects for approach to negotiations

Note

[1] R. Meredith Belbin. 1984. *Management Teams. Why they succeed or fail.* Buttersworth-Heinemann

Other recommended literature

R. Meredith Belbin. 1993. *Team Roles at Work.* Buttersworth-Heinemann

Geert Hofstede. 1991. *Cultures and Organizations. Software of the Mind.* London: HarperCollinsBusiness

Jeanne M. Brett. 2001. *Negotiating Globally.* San Francisco : Jossy-Bass

Roy J. Lewicki, David M. Saunders, John W. Minton. 1999. *Negotiation.* Third Edition, Singapore: McGraw-Hill Book Co

PCCP/catalic/CM01

Teaching topic 4.8: Guided debriefing – Teambuilding/Role clarification

Checklist of main elements of teambuilding in a negotiating setting

- *Focal points for the debriefing*

1. Team roles can be viewed from a functional and team perspective.

Did you experience during the training session (4.6) a discrepancy between the requirements of the team role assigned to you and the qualities with which you contributed or preferred to contribute to the negotiation? You may want to distinguish between qualities that you see as important to good performance in a negotiation and characteristics of the role that you were asked to play in the training (sheet 1).

Sheet 1 – Team requirements and individual qualities

Team requirements – functions	Team requirements – roles	Key individual qualities

2. Effective negotiation requires good team work, not only from a functional perspective but also in the distribution of team roles.

What are your main findings as to the quality of team work? List positive experiences and shortcomings. Identify possibilities for improvement and mark those that could even be applied in a time limited training setting (sheet 2).

Sheet 2 – Quality of teamwork

Positive experiences	Shortcomings	Improvements

3. International negotiations generally cross cultural boundaries. Within countries cultural differences between organisations impact on negotiations.

Was there in your view a noticeable impact in the communication between the members of your team and between your team and other teams that you would ascribe to differences in cultural background of participants? Make an inventory listing differences that were felt as conducive and others that may have interfered in the process of communication. Distinguish, if possible, between aspects of national and of organisation culture (sheet 3).

Sheet 3 – Cross cultural aspects

National Culture Conducive	National Culture Interfering	Organisation Culture Conducive	Organisation Culture Interfering

- *Items for a general discussion on the basis of debriefing by teams and adding participants' past experience in negotiating teamwork*

    1. The composition of negotiating teams and the selection of its members.
        - institutional and
        - individual aspects

    2. The team requirements in terms of knowledge and skills and the qualities of individual team members.

    3. Opportunities for team building.
        - Essentials and realistic scope of team building
        - Formal team meetings
        - Informal contacts
        - Aspects of organisational culture
        - Code of conduct

    4. Evaluation of team performance and feed back.

    5. Dealing with success and failure.

- Summing up: main lessons learned.

(annex: work sheets 1 + 2 + 3)

PCCP/catalic/CM02

Teaching topic 4.8: Guided debriefing – Teambuilding

Work sheet 1 – Team requirements and individual qualities

Team requirements - functions	Team requirements - roles	Key individual qualities

PCCP/catalic/CM04

B1+B2 - Teaching topic 4.8: Guided debriefing – Teambuilding

Work sheet 2 – Quality of teamwork

Positive experiences	Shortcomings	Improvements

PCCP/catalic/CM05

B1+B2 - Teaching topic 4.8: Guided debriefing – Teambuilding

Work sheet 3 – Cross cultural aspects

National Culture Conducive	National Culture Interfering	Organisation Culture Conducive	Organisation Culture Interfering

PCCP/catalic/CM06

B 4.6

National negotiation preparation

Code	B 4.6
Teaching topic	National negotiation preparation
Time (hrs)	2
Content/Skill focus	National preparation for decision-making: organisation, functioning and participation of various stakeholders.
Objectives	To improve national negotiation preparation.
Learning methodology	Guided debriefing in plenary setting. Participants share experiences and receive theoretical background. Plenary discussion; share experience.
Trainer/facilitator guide	- Focus debriefing from role play by teams through use of a checklist of main elements of teamwork. - Facilitate additionally a sharing of participants' past experiences in negotiating teamwork: lessons learned.
Course book	Jan Peter Dijkstra: "National negotiation preparation"

Teaching topic 4.9 National negotiation preparation

National negotiation preparation

Jan Peter Dijkstra, CATALIC

Introduction

The most prominent functions of modern diplomacy are consultation, mediation and negotiation. Traditionally diplomacy was the field of bilateral relations and, in a somewhat broader context, a tool in forming coalitions between nations in times of peace and war or, undermining them for that matter. The rapid development of regional and international cooperation, integration and globalisation has given strong impetus to multilateral and conference diplomacy, often institutionalised in regional or international forums and organisations. The most significant developments took place since the establishment of the League of Nations, followed by the United Nations and Bretton Woods organisations and their subsidiary network of institutions.

In the economic and financial sectors the emergence of multinational companies and the expansion of international trade and investments also opened new terrain where international negotiation became a key tool in doing business successfully abroad.

A significant, but more recent development in terms of its scale and impact, is the international cooperation and action of non governmental originations, being in a large number of fields recognised actors and players in international consultations and negotiations. The most visible are international NGOs representing human rights and environmental interests and those active in development cooperation. It is therefore long ago that the world of international consultation, mediation and negotiation was the almost exclusive arena of career diplomats and foreign ministers.

Focus of the note

This note focuses on the main elements of national preparations for international negotiations. It does not distinguish between types of negotiation or they manner in which they are conducted (competitive; integrative; mediation) as that will be the focus of other parts of this course.

A number of elements that are critical to a good preparation of any type of international negotiation are listed in this note. However, be aware that structures and procedures already in place in the context of IWRM negotiations in the region, may have a consequence for what is practicable and what is not. The exchange of experience by participants on this subject during the course may lead to fresh insights and perspectives that may impact on the way participants would like to prepare for future consultations and negotiations.

This note follows the order of elements summed up in the attached process overview, which is also containing the items for discussion. The attached work sheets 4 and 5 facilitate the registration of good practices, constraints and possible improvements on national negotiation preparation. They differentiate between the institutional and team work aspects.

Organisational structure in negotiations

Countries may have to enter into negotiations without having a ready structure (organisation; set of rules and procedures) to support them in the preparation and/or conduct. This is often the case if a new conflict emerges or an immediate interest needs to be served. In this situation negotiators may have to set up an appropriate format and will have to agree on how the negotiations will be conducted.

In most international negotiations the support structure has been set by longstanding institutional development (United Nations; regional organisations like the EU, NATO, Asean; Rhine Commission etc). Diplomacy and negotiation have become part of the main working instruments and routine of these organisations. They have developed their own traditions, embedded in their own organisational culture. This is having an impact on the way in which representatives (can) negotiate in such organisations. This is not only defined by the agreed rules and procedures, but also by elements of culture, standards for behaviour that are or have been introduced, explicitly or implicitly, by the representatives of members and the officials of these organisations . Some may have a dominant effect on the way business is being conducted. There is in the arena of (institutionalised) negotiating through (major/global) international and regional organizations and conferences a common understanding and acceptance on the appropriateness of the negotiating practice put into play. These diplomatic traditions and standards contribute to the effectiveness of negotiations and give participants a kind of formal and psychological security as to the fairness

of the playing field from a procedural and possibly behavioural perspective. The latter appreciation will no doubt be open for dispute as one can often witness in negotiations types of behaviour that are declared "out of line" by other participants or observers. Most of these types of behaviour are used as a tactical tool, not to disrupt negotiations or its foundations as such.

Absence of clear cut structure or only the availability of a rudimentary framework for consultation and negotiation (like the traditional bilateral channels or early stages of institutional development in treaty frameworks) offers the opportunity to create modern and effective support structures, fitting the needs and interests of the parties. Learning from the growing pains of more advanced institutions, and by preserving existing traditions in international or regional exchange that have proven their effectiveness, will enrich diplomatic negotiating practice in its ongoing development. Developments in regional institution building in Africa, and more specifically in SADC, are a case in point.

Good preparation: key to success

Key to the effectiveness of any negotiation is thorough preparation. We will discuss separately the requirements of a negotiating team in terms of skills, as the sum (and more than that) of the qualities of individual negotiating team members.

The process of preparation as described on this note follows a number of logical steps. Depending on the context and history of a negotiation preparation work will not always be as intensive as in a situation where one has to start from scratch, for example entering into a new field or joining a negotiation as a new player. Most of the tasks to be performed for effective preparation of negotiations are almost universal. Though there is general recognition of the wisdom of good preparation, real life does not always bring out the best possible or does not always allow parties to prepare to the most desirable extent possible. Constraints in time and resources are here the most common causes. If mainly the human element is critical for preparation, as it is in many cases, one can have a strong positive impact on the outcome of negotiations by undertaking a solid preparation.

Critical factors in preparing negotiations

Looking at the elements of a preparation process one can identify – not limitative - the following critical factors.

1 – Definition of frame, goals and strategy

- Clarity of objectives; needs/interests; priorities
- Role of national strategic framework for sector, theme, related fields
- National policies
- Broader or hidden interests, documented or otherwise communicated
- Awareness of negotiating history, in terms of frame, objectives, strategy, issues, interests and priorities, including that of other parties
- Applicable international/regional regimes; commitments/obligations/rights
- Analytical and strategic skills

> The larger part of 1 will be covered by desk preparations. Ideally general political directives are supported by information early on in the process. As this is often not the case development of goals and strategy may go hand in hand and once defined, the planning stage will add refinement to the preparations: defining issues, interests, targets and limits and assessing the other parties.

2 – Desk preparations

- Positioning
- Resources and capabilities – human and financial
- Access to sources of information

> *An agreed negotiation agenda will facilitate preparations. The agenda needs often to be negotiated and can have an important impact on the substance of the negotiation. Its approval, in timing and substance, requires therefore careful tactical consideration. Agenda setting can be an important part of negotiation strategy and planning. Agreeing on a negotiating protocol may be part of this process.*

3 – National coordination

- Position / authority of coordinator(s)
- Functioning network
- Open lines with political authorities
- Awareness of demands and expectations of stakeholders, inside and outside government

> National coordination usually follows traditional patterns, putting a sector ministry or a foreign affairs ministry in the leadership role. Often responsibilities are shared. In a number of countries the role of foreign ministries in negotiations related to technical sectors is weak, notwithstanding the fact that they formally have the coordinating role in international .

4 – Information gathering / positions of other negotiating parties

- Access to sources / negotiation history in documents or person; capability to open new sources, to access informal sources
- Effectiveness and quality of institutional memory
- Access to and effectiveness of channels to other parties
- Research, intelligence and analytical capabilities; technical support systems
- Capability to assess strengths and weaknesses of other parties' positions and negotiators

> *Meeting with the other side before the actual negotiations will offer an opportunity to compare notes on issues, priorities, interests etc. It may give a perspective about their point of view and can nuance perceptions on substance and on attitudes one may have developed. It is not unusual for negotiators to give the other party detailed information on their position and appreciation of issues ahead of negotiations. This could be bargaining tactics, a sincere attempt to be open in information exchange, or both.*

5 – Initial outline national position

- Credible and feasible approach in terms of objectives, strategy and initial balancing of interests of national stakeholders

> In the framework of national coordination an outline could be based on written contributions of stakeholders and circulated to them as a step in developing a negotiation mandate. It should properly reflect to what extent these contributions are part of the draft mandate. In case of conflicting interests or difference of opinion between stakeholders the outline should highlight the subjects which would need consultation. It is a good practice to facilitate discussion in an open and transparent process.

6 – Consultation / negotiation national stakeholders

- Similar to factors under 3

> One of the most complicated questions is the relative weight that should be given to various positions around the table. Though the preparation of a national position is often a negotiation in itself, it is important for a successful conduct of negotiations and the follow up in national implementation, that stakeholders feel that their views and interests have sufficiently been taken into account. The balancing of interests is by nature a political process. The quality of this part of the consultation process is a very critical factor.

7 – Approval of mandate / composition of delegation

- Political support
- Inclusion of relevant stakeholders/qualities/skills in delegation

> *Government delegations are often of a mixed composition. In many instances the selection of officials on delegations is related to the position or function that they are holding. Not all of them have been selected for these posts because of their negotiating skills. Those who bring these skills to the negotiating table are not always experts in the technical and substantive field of the negotiation. That is why the appropriate mix of disciplines and talents should be represented in a delegation and the question whether that mix is available should be considered at an early stage of negotiation preparation.*

8 – Preparation of negotiating dossier

- Organisation and accessibility of information

> A good file or executive summary is underpinning the request for political approval of the mandate. It puts delegation members on the same level of information and supports the delegation as a starting point. It supports both negotiators and principals at home as reference document when negotiations progress. Keeping it up to date during negotiations, as a register for documents exchanged and notes and reports made, will facilitate final reporting and the preparation of follow-on action, including possible negotiations.

9 – Reporting / feed back to stakeholders

- Open and effective lines of communication – vertical and horizontal
- Political engagement
- Responsibility and commitment to follow-up

> *Public reporting, besides the provision of feedback through official reporting and otherwise to principals and government stakeholders, for example to parliament and press, contributes to transparency in the conduct and outcomes of international negotiation.*
>
> Translation of the consequences of international commitments into national action, like policy adjustments, limitations or expansion of existing rights or interests, national law making etc. may suffer from capacity problems.

Recommended literature:

Roy J. Lewicki, David M. Saunders, John W. Minton. 1999. *Negotiation*. Third Edition. Singapore: McGraw-Hill Book Co.

Jeanne M. Brett. 2001. *Negotiating Globally*. San Francisco: Jossey-Bass.

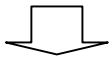
Jan Melissen Ed. 1999. *Innovation in Diplomatic Practice*. New York: Palgrave

PCCP/catalic/CM07

Teaching topic 4.8: Guided debriefing – National negotiation preparation

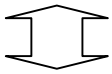
General process overview of negotiation preparation

1. Initial definition of frame, goals and strategy

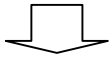


2. Internal preparations – desk work

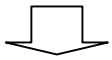
3. National coordination - Inventory of views and positions of national stakeholders: consultations / negotiations at working level with
   - government departments
   - rep's private sector
   - NGOs



4. Information gathering and exchange of views and positions with other parties to the negotiations (in part supplementing previous desk work)
   - research
   - direct contacts
   - diplomatic and political demarches

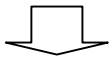


5. Initial outline of national position



6. Consultations / negotiations with national stakeholders (working level / senior / political level)

7. Approval of negotiating mandate and composition of delegation
   - senior official's
   - ministerial or governmental level



8. Preparation of negotiation dossier for delegation members

----------INTERNATIONAL NEGOTIATIONS----------

9. Reporting and feedback to stakeholders

Items for discussion

- Main good practices and main constraints in national preparation on the basis of the process overview elements. Differentiate between institutional and teamwork aspects.
- Factors critical to effective preparation.
- Identify possible approaches to the improvement of shortcomings.

(annex: work sheets 4 + 5)

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Teaching topic 4.8: National negotiation preparation

Work sheet 4– Institutional aspects

	Critical factors for effective preparation	Good practice institutional	Constraint institutional	Possible improvements
Frame, goals and strategy				
Desk preparations				
National coordination				
Info gathering / positions other parties				
Initial outline national position				
Consultation / negotiation national stakeholders				
approval mandate / composition of delegation				
Preparation negotiating dossier				
Reporting /feedback to stakeholders				

PCCP/catalic/CM09

Teaching topic 4.8: National negotiation preparation

Work sheet 5 – Teamwork aspects

	Critical factors for effective preparation	Good practice teamwork	Constraint teamwork	Possible improvements
Frame, goals and strategy				
Desk preparations				
National coordination				
Info gathering / positions other parties				
Initial outline national position				
Consultation / negotiation national stakeholders				
Approval mandate / composition of delegation				
Preparation negotiating dossier				
Reporting /feedback to stakeholders				

PCCP/catalic/CM10

Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 5

Strategy

Table of contents

B 5.1

Public participation

Code	B 5.1
Teaching topic	Public participation
Time (hrs)	2
Content/Skill focus	Public participation Information sharing Consultation and feedback Decision-making (Negotiated Investment Strategy)
Objectives	1.To critically evaluate the concept of consensus To examine processes for public participation.
Learning methodology	Exercise Plenary summary.
Trainer/facilitator guide	Utilise 'nominal group technique' for exercise. Plenary discussion.
Course book	

What	Time	Process and Contents	Materials
Opening **Objectives** **How?** **Recommend**	15 mins	1. **Introduction** - Indicate my background in NRM in the region, what the purpose of this session is: ▪ To explore challenges and opportunities (of the process) for public participation • The way we will do that is first by splitting into various water user groups and for each group to discuss the following questions: • What are the water needs of each group? • How would they go about securing their needs, i.e. – how would they pursue their ends? • What resources would each group have to advance their needs? • In plenary – groups will discuss the following – mapping to how they would secure their needs (what strategies they would use to secure their needs) → I would urge you to bring in examples of any agreements that might amplify certain points - Where possible, specific examples will be used to highlight certain points.	
Groups	10 mins 15 mins 30 mins	**2. What resource user groups can you think of both from an urban and rural perspective within a basin?** **Plenary** → Dividing participants into groups – recapping the questions to be dealt with in the groups. - In your discussions, imagine there is an agreement around water issues to be settled among different countries, how can this be relevant to your water needs, what strategies would you employ to get your needs addressed? Strategies to be discussed in plenary on returning; Needs to be on A4 paper - **Plenary** **Group discussions**	Flip chart 1 → list of user groups (4-5)

Securing needs	30 mins	→ Feedback: Group strategy mapping – hopefully this will begin to highlight some of the potential conflicting areas. Public participation emerged as part of a challenge to a dominant paradigm of centralised development planning. It was meant to take into consideration the needs of those on the ground. -It is a top-down/bottom-up narrative stream-	Flipchart
Challenges	25 mins	→ Discussion- From this exercise, what would you say are some of the challenges of public participation? • Different tenure regimes in the different countries hence management regimes might be conflicting • Unequal power relations – from national point of view, from the communities perspectives – so whose needs get addressed first? • Knowledge of tenure regimes are influenced by education – for example, the distribution of rural and urban populations within the LRB-	
Objectives		What would your objectives for participation be? • Openness – to present information on intended developments (and then what?) • To get views, perspectives of those affected – and do what with them? Participation cannot be a vehicle to resolve conflicts between different user groups (give the example of market gardens and stream flow requirements; the example of Botswana damming catchment streams of the LRB – what would participation bring to this situation?) • To avoid the imposition of river basin management regimes from national power centres onto peripheral border communities (but does this necessarily address conflicting interests – how far can one take participation?)	

B 5.2

Networking and lobbying

Code	B 5.2
Teaching topic	Networking and lobbying
Time (hrs)	2
Content/Skill focus	Diplomatic practice in networking and lobbying Networking and lobbying from a grassroots perspective
Objectives	To deepen understanding of role and impact of networking and lobbying in preparation and conduct of negotiations. To identify good practices
Learning methodology	General introduction and plenary discussion.
Trainer/facilitator guide	- Introduce the subject in summary. - Invite participants to share experiences; categorise and register practices. Distinguish between preparation and conduct of negotiations and feedback to stakeholders. - Discuss good practices from a global and regional perspective.
Course book	Jan Peter Dijkstra: "Networking and Lobbying: diplomatic practice"
Reference	“Negotiating Globally”, J.M. Brett, 2001

Teaching topic 5.2 – Note - Networking and Lobbying: diplomatic practice

Networking and Lobbying: diplomatic practice

Jan Peter Dijkstra, CATALIC

Introduction

Networking and lobbying are part and parcel of diplomacy. Lobbying cannot be done effectively without a cultivated network and without effective communication.

Diplomacy in former times was seen as a specialized activity of diplomats, mainly exercised abroad. Posted in a foreign country a diplomat's main tasks were to maintain good contacts with representatives of the host country, undertake demarches, to report and advise on developments of interest to his home country, mainly political en economic, and to do consular work. He was representing his country by attending official events and functions and more actively by promoting various interests of his country. This is still an important part of bilateral diplomatic work, but requirements have changed.

Post second World War developments, like the process of decolonisation, the end of the East-West confrontation, the resulting huge increase of (state) members of the international community, the tremendous growth of multilateral organisations and conference diplomacy has altered the diplomatic metier drastically. The same goes for the technological revolution in transport, telecommunication and informatics. The effects of the latter developments on the role and functioning of the national and international media, particularly in following and reporting on international events and affairs, create new channels of communication from government to government and from government to the public.

In a world of growing interdependence and integration, both on the (sub)regional and international level, a diplomat needs more than ever to be thoroughly informed about the issues of importance to his country in their wider regional and international context. When stationed at home, and this is occurring more frequently than in the past, diplomats today are in their work directly concerned with many aspects of public

administration, like national policy preparation, public opinion and public information, the legislative process etc. In the specific field of national coordination of international questions officials of coordinating ministries need to know how to deal with the interests of various national stakeholders, being it in the public or in the private domain.

Diplomatic network

The diplomatic network has undergone important changes, in part in consequence of the aforementioned developments, but also owing to shifts in focus and priority in diplomatic work and the growth of parallel diplomatic activities. The actors in this field are politicians, internationally operating representatives of technical government departments, regional governments , cities etc. On the non governmental side they are NGOs, academic institutes, associations and business people active in international affairs. This has brought new challenges to diplomats in maintaining their relevance and in developing their niche in international work, distinct from but complementary to activities that have gradually been taken over by new players in diplomacy.
Within diplomatic missions, permanent or temporary (for example in UN and OCSE peace keeping), the growth of specialists seconded by technical government departments has been significant particularly in permanent representations at international organisations and in large bilateral diplomatic missions. A special case form government agencies working in development cooperation of which many have their specialised staff (formally) under the roof of their embassies.

One way of giving special attention to a specific sector in the work of a diplomatic mission is the above mentioned secondment of experts (attaché's) to an embassy, for a limited (programme or project related) or for a longer duration. A second option is the explicit extension of the tasks of diplomats working in a related field with the sector in question. A third but lighter form is to instruct the mission to brief periodically on a number of pre-specified items. A well informed representative who has build a good network could be an asset for a negotiating team once issues between the countries in that sector need to be negotiated. All options mentioned presuppose a open and effective working relationship with both the technical ministry and the foreign ministry at home.

Even though foreign affairs in most countries are formally the responsibility of the foreign minister or in a number of cases of the head of state, diplomatic activities of other government members has become a normal feature of international work. The role in international relations of certain technical ministries have become very prominent, both in the multilateral and the bilateral fields, for example in defence, international cooperation, transport, trade, environment, water, fisheries etc. The institutional arrangements of regional and international organisations usually codify this development. In the Southern African

sub-region SADC is a good example of progressive institutionalisation of cooperation in the various SADC sectors.

Non governmental stakeholders involved in or affected by cross border activities have increasingly developed and often institutionalised the representation of their interests on an international level. Sometimes by creating partnerships under a regional or international umbrella, in other cases by seeking representation through institutions that make of lobbying and networking their daily business. Developments in the institutional framework of and around the European Union are a case in point.

Target groups

The identification of target groups in lobbying and networking needs timely and careful consideration. So does the mode and timing of approaching target groups. Potential target groups are listed in the attached overview. A distinction is made between target groups related the national preparations of negotiations and those relevant for international negotiations. Once targets groups have been identified it is important to consider the precise contents of the message and the way it will be communicated.

On the national scene (existing) frameworks of consultation (for example in IWRM water boards, institutions representing water related commercial interests, environmental NGOs) can serve as a channel. Abroad, the diplomatic network there can be mobilized to undertake a reconnaissance of ideas, feelings, interests and positions of other parties. The same applies to existing regional and international networks of officials, technicians and academicians in this field and formal structures of international consultation, like permanent water commissions.

Actions and contacts

Diplomatic work, both in the multilateral – conference – setting, as well as in the bilateral relations consists of a varied types of action in support of national interests. A number of actions in context of (preparation) negotiations are not much different from general diplomatic activity, like information gathering, analysis and reporting; initiating relevant contacts; building trust in the personal relations with the host countries officials and other key persons etc. The presence of a diplomatic representation allows a government to gather information on a routine basis and to build and deepen contacts that will facilitate the regular exchange

between the countries. In the event of emergencies or sudden developments such dedicated institutional links may prove to be very useful for unhampered communication.

In a stage where an (initial) national negotiation position has been prepared it can be useful to present (elements of) it to selected members of target groups – both at home and abroad - as part of an information/media or lobbying campaign.

Moving a lobbying exercise to the political level can be a good solution to unlock certain situations or to pave the way for work of officials.

In the context of regional cooperation ministers and heads of state meet regularly and are in a position to raise certain matters (informally) on the margins of their meetings with a view to facilitate progress.

Contacts, if confined to negotiations and their preparations will mostly be in the formal domain. However, informal occasions may offer excellent opportunities to hear more about backgrounds, about concerns and perceptions and about interests underlying positions. They also offer opportunities to test the ground on substance and procedure.
The continuing growth of networks of professionals active in international water affairs, meeting and working together also outside the scope of formal negotiations, will create an environment where trust and understanding can be furthered, enhancing the prospects for better outcomes of negotiations in that field.

Recommended literature:

Jan Melissen Ed. 1999. *Innovation in Diplomatic Practise*. New York: Palgrave.

PCCP/catalic/CM13

Teaching topic 5.2 - Networking and Lobbying

Diplomatic practice in a negotiation context: overview elements and items for plenary discussion

Overview

	PREPARATIONS: NATIONAL CONSULTATIONS AND NEGOTIATIONS	INTERNATIONAL CONSULTATIONS AND NEGOTIATIONS
TARGET GROUPS	▪ National government departments ▪ Stakeholders at lower governmental levels ▪ Politicians ▪ Private sector ▪ Interest groups / NGOs / Academic centres ▪ The public ▪ The press ▪ Foreign government rep's	▪ Delegations ▪ Independent chairs / Mediators / Secretariats ▪ Rep's foreign governments ▪ Diplomatic missions ▪ Internationally operating interest groups and NGOs ▪ The press
TYPES OF CONTACT	▪ Formal – informal ▪ Face to face - telecom ▪ Bilateral – Groups ▪ Preparatory meetings ▪ Coordination meetings ▪ Delegation meetings ▪ Intermediary contacts through diplomatic missions ▪ Social events / meals ▪ Other meetings / conferences	▪ Idem ditto ▪ Idem ditto ▪ Idem ditto ▪ Conference, caucus and corridor meetings ▪ Idem ditto ▪ Occasionally ▪ Idem ditto

TYPES OF ACTION	▪ Information gathering + analysis ▪ Engaging resources ▪ Building awareness of powers and interests ▪ Definition and testing of goals + initial approach ▪ Initiating contacts / Build relationships ▪ Building trust and confidence and commitment ▪ Enhance understanding of different (national) interests ▪ Idem ditto for interests of international parties ▪ Promotion and testing of realistic and sustainable solutions ▪ Identification of creative solutions ▪ Promotion of partnership and coalitions ▪ Negotiating a mandate	▪ Continue selective info gathering + analysis ▪ Awareness of shifting interests ▪ Adjust if needed ▪ Pursue and identify new opportunities ▪ Idem ditto ▪ Remain informed about interests and shifts ▪ Pursue and feed back to principals ▪ Idem ditto ▪ Idem ditto for international partners and parties ▪ Check limits and advise about additional instructions

Items for discussion

1. Performance in the field of networking and lobbying during national preparations and supportive actions beyond the immediate need for international negotiation. Feedback to stakeholders.
2. Practice of lobbying and networking during the process of international negotiation
3. Good practices and challenges with regard to target groups, types of contact and types of action. The regional and global perspective.

(annex: work sheet 7)
PCCP/catalic/CM14

Teaching topic 5.2 - Networking and Lobbying

Work sheet 7 – Good practices and challenges

	National preparation Good practice	National preparation Challenge	International negotiations Good practice	International negotiations Challenge	Regional perspectives
Target groups					
Types of contact					
Types of action					

PCCP/catalic/CM16

B 5.3

Shared vision development

Code	B 5.3
Teaching topic	Shared vision development
Time (hrs)	3
Content/Skill focus	Shared vision development
Objectives	To enhance skills to create a common vision.
Learning methodology	Input Small group work
Trainer/facilitator guide	Using the case study as a basis, facilitate the development of a common vision between groups. Reflect on process and identify lessons.
Course book	F. Jaspers: “Shared vision development in international river basins”
Course reader	R. Costanza: "Visions of alternative (unpredictable) futures and their use in policy analysis." *Conservation Ecology* 4(1): 5.
Further reading	

Shared vision development for international rivers; with special reference to the Nile river basin

Frank G.W. Jaspers, UNESCO-IHE Delft

Abstract

In order to improve global water security, much is expected from institutional development processes to facilitate the articulation of a shared vision for the management of international river basins. In this paper some background information is provided on recent efforts to facilitate the shared vision development for international river basins. The paper identifies the intimate connection of water conflict prevention and the application of integrated water resources management. The crucial steps in fostering a shared vision on the common and sustainable utilisation of the resources of the international river basin are described. The vision is expressed by the respective national decision makers in line with the interests of the relevant stakeholders. A platform is created in which decision makers from all riparian countries are represented in a balanced way. Active participation of direct stakeholders is institutionalised. The platform of decision makers is supported by technical experts and trainers from the respective riparian countries. The vision is accompanied by policy guidelines, institutional and financial arrangements for implementation and by an extensive programme of capacity building. As an example of how theory can be brought in to practice the Nile Basin Initiative is described in its endeavours of platform creation, institutional arrangements and shared vision development processes as well as in modalities of assistance in financing and capacity building.

Key-words: capacity building, integrated water resources management, international rivers, Nile Basin Initiative, platform creation, shared vision development, stakeholder participation

1. Introduction

One of the best tools to avoid or resolve water disputes, either domestic or regional, is to manage water resources in an effective and efficient way aiming at environmental, social, economic and political sustainability (Jaspers, 2000). In other words: by departing from water management organised by various sectors and on administrative boundaries and going towards integrated water resources management. To apply an adequate level of integrated water resources management in a domestic situation is a substantial challenge that requires serious and continuous effort. More often than not ambition levels have to be set in a realistic way. Integrated water resources management reflects more an ideal situation, a way to go with a terminus that cannot really be

reached. Substations have to be identified as realistic targets and intermediates between the actual situation in a country and the desired situation that reflects the ambitions of the involved stakeholders (van Hofwegen and Jaspers, 1999).

To reach an adequate level of integrated water resources management for an entire international river basin is an even greater challenge with profound political and social bottlenecks and with a need for complex institutional arrangements. Crucial is to design a balanced policy or strategy approach in line with the interests of relevant groups of stakeholders.

A precondition for any process of policy and strategy development for effective and efficient water resources management is the articulation of a shared vision. The shared vision on the common and sustainable utilisation of the resources of the international river basin is expressed by the respective and applicable national decision makers in line with the interests of the relevant stakeholders.

2. Definition

A shared vision for the management of international rivers can be described as a common understanding between relevant decision makers from each of the riparian states on the projection of a desired future situation with regard to the common and sustainable utilisation of the natural resources in the entire river basin. This understanding is reached after consideration of the challenges, opportunities and bottlenecks with regard to management of the basin's resources. The vision is developed in close consultation with platforms of relevant stakeholders and interested parties.

3. Constituting the platform

Any process of shared vision development will be preceded by a stage in which international partners are invited to express their interests and to establish a platform to identify challenges, opportunities, bottlenecks and to formulate the required policies, strategies and approaches. The platform should have decisive authority and it should reflect the interests of the various groups of stakeholders in the riparian states. Preferably a mechanism is created to sound the interests of the stakeholders directly. To constitute such a platform with a balanced political representation is probably the most difficult stage.

A precondition for a group of states to be willing to establish a platform is the perception of a clear self-interest, the acknowledgement of a common problem or common opportunity. Full representation of riparian states is of prime importance. The absence of vital (upstream) partners in the platform might heavily jeopardise the process of developing an effective shared vision. The Mekong River Commission (1995) and its predecessor the Mekong Committee (1957) is still heavily hampered by the fact that the upstream states of China and Myanmar are not a member of the platform. These upstream states never saw the

need to boost co-operation potential through this platform (Mekong Commission, 1999). The process of the water ministers of the Nile riparian countries to agree to come together and to discuss important issues was probably the most difficult stage in the process of establishment of a Nile Basin Initiative (Nile Basin Initiative, 2000).

Sometimes a disaster like a drought or a flood and the subsequent building up of international pressure can be an extra incentive or trigger to opt for co-operation potential rather than for potential conflict. The establishment of the International Rhine Commission and the enlargement of its mandate took place after a series of serious environmental disasters (Mostert, 1998), which really influenced public opinion.

An existing and not resolved water dispute on the other hand, may heavily jeopardise the process of establishing and developing a shared vision. An exercise in resolving water conflicts first before a shared vision is formulated may precede the process of establishing a platform. Reference is made to the normal procedures of settlement of disputes (United Nations Convention, 1997): facilitation, negotiation, fact finding, mediation, arbitration, litigation for the International Court of Justice (Article 33). The process of formulating a shared vision based upon identification of opportunities, challenges and bottlenecks might de facto contribute to settle or avoid water disputes peacefully, but it is certainly not designed for that purpose. It is more designed for fostering co-operation potential and capitalising on that.

Crucial in the process of establishing a platform is to convince the partners that the issue is not only sharing scarce water resources but also really sharing benefits from these scarce water resources and other natural resources (e.g. power trade against water). Thus, the discussion about trade-offs is opened.

If states still have reservations against participation in a platform for decision making they may opt for an observer capacity first. That gives them the time to get familiar with the procedure, build up confidence and garner internal political support and mandate.

4. The process of developing a shared vision: The Nile Basin Initiative

The process of developing a shared vision does not make much sense if it is not accompanied by the development of policy guidelines and the design of a continuous or intermediate co-operative institutional framework. In the case of the Nile Basin Initiative the Council of Ministers of Water Affairs of the Nile Basin (Nile-COM) at its extraordinary meeting in February 1999 adopted together with a Shared Vision also a set of policy guidelines (NBI 2000). The Shared Vision is:

> *'To achieve sustainable socio-economic development through the equitable utilisation of and benefit from the common Nile Basin water resources'.*

The policy guidelines which provide a basin-wide framework for moving forward with co-operative action, set forth the primary objectives of the Nile Basin Initiative:

- 'To develop the water resources of the Nile Basin in a sustainable and equitable way to ensure prosperity, security, and peace for all its peoples.
- To ensure efficient water management and the optimal use of the resources.
- To ensure cooperation and joint action between the riparian countries, seeking win-win gains.
- To target poverty eradication and promote economic integration.'

Before the design of a final legal and institutional framework a transitional institutional arrangement was established:

- Council of Nile Ministers (NileCOM) for decision making;
- A Technical Advisory Committee (Nile-TAC) for policy preparation and implementation;
- A Secretariat (Nile-Sec) to support NileCOM and Nile-TAC in whichever way.

The choice for the creation of a transitional institutional arrangement was a very deliberate one. A process of setting up a final appropriate legal and institutional framework to structure the Initiative beforehand would have taken several years. It involves the harmonisation of the national legislation of all the riparian countries. To wait for the lawyers to agree on such a complex operation could jeopardise any initiative. It goes without saying that during the implementation of the shared vision legal foundation should be established.

5. Implementation of a shared vision

A vision without action is not a very useful exercise. The preparation of a common vision should provide a framework for activities on the ground and these activities, in turn, realise the shared vision. Activities could have a basin wide scope to create an enabling environment, but could also be restricted to a part of the basin or to a single country, whichever level is appropriate. Important is a mechanism to illustrate the benefits and externalities of planned activities on other partners and groups of interests. Crucial is also to take decisions in conjunction with the involved stakeholders or interested parties. Therefore, action should be based on a logical cyclic process of international water resources planning.

A few elements of this process in a nutshell:

- Identification of problems and challenges
- Data generation, collection and exchange
- Generation of information and knowledge from these data
- Formulation of development scenarios and alternatives
- Structured stakeholder participation in decision making
- Identification of benefits, impacts and externalities
- Financial and implementation arrangements
- Decision making
- Implementation

- Monitoring, evaluation and feed-back

A shared vision development programme should be accompanied by an investment programme with sufficient and clear financial arrangements to guarantee the implementation of the vision. The availability of funds may be a significant incentive for countries to join any international platform. In order to avoid 'free riding' it is advisable that any member country or partner contributes to at least the operational costs of developing the vision. That will certainly boost the ownership of the initiative.

6. Capacity building

Any shared vision development programme will have distinct requirements for capacity building, being an indispensable mechanism that underpins and supports the development of the shared vision as well as the implementation. Capacity building can be formulated as follows (Alaerts e.a., 1996):

> '*Capacity building is the process to provide individuals, organisations and the other relevant institutions with the capacities that allow them to perform in such a way that the sector as an aggregate can perform optimally, now as well as in the future. Capacity building helps initiating and supports institutional strengthening and reform. It is the process of implementing institutional development. The capacity building process (I) assists in the diagnosis of sector performance and institutional strengths and weaknesses; (ii) articulates and prioritises the required capacities that need to be imparted to the individuals through capacity building need assessment; and (iii) implements the support by using a variety of tools and instruments. Capacities are the knowledge, skills and other faculties, in individuals or embedded in procedures and rules, inside and around sector organisations and institutions.*'

Capacity building therefore deals with:
- The creation of an enabling environment with appropriate policy and legal frameworks;
- Institutional development, including stakeholder participation;
- Human resources development and the strengthening of managerial systems.

As such capacity building is an indispensable tool to shape and implement a shared vision.

7. The Nile Basin Initiative: bringing theory in to practice

A case in which the process of shared vision development has been adequately addressed and which is reasonably well described is the Nile Basin Initiative. The interaction between decision making and capacity building as well as the description of related processes is reflected by the well-known temple picture (see fig. 1). In the case of the Nile Basin Initiative the shared vision (A) is underpinned by a cooperative

framework (B), being the main institutional arrangement. Supporting this 'roof' are four major basin-wide theme areas [C-F] which are as major capacity building efforts the 'pillars' under the basin-wide Shared Vision Programme. Other activities will be added as they are needed and agreed upon. All activities within these tasks have a major capacity building component and contribute to human resources development within the basin - this provides the 'foundation' of the proposed program (G).

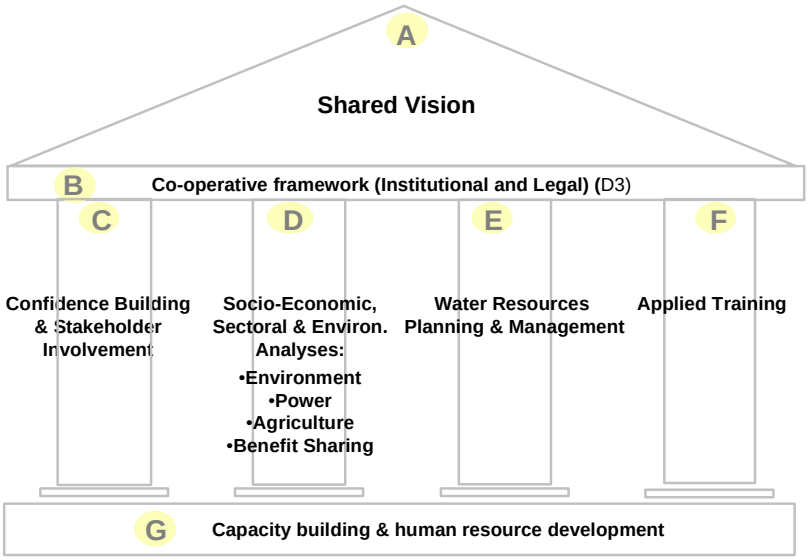

Figure 1. Basin-wide Shared Vision Programme (NBI 2000)

Through this programme in each of the ten Nile riparian countries a contingent of decision makers, experts, trainers and stakeholder representatives is created to 'own' and implement the process of shared vision development. The programme hinges on equitable distribution of responsibilities and resources. The basin wide shared vision development process is underpinned by relevant capacity building efforts. In fact, the whole exercise is an institutional development effort in itself. The process is supported by and supports action on the ground. Capacity building efforts are facilitated by huge financial donor support (grants). Action on the ground is supported by an extensive investment programme (loans). So far, considerable co-operation potential between the Nile riparian countries has been articulated through the initiative.

8. Next steps

The development of a shared vision cannot be the end-station of the process of integrated international river basin management. Various steps are still to follow culminating in the establishment of permanent institutional arrangements and the production of a strategic water resources management plan. From there onwards issues like infrastructure development, international water allocation, flood control and operational planning, environmental protection, water valuation, benefit sharing etc. can

be taken up. These steps follow basically the same route as domestic integrated river basin management (see Jaspers, 2002).

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Course B

Conflict Prevention and Cooperation in International Water Resources

Course book

Part 6

Negotiation Roleplay

Table of contents

B 6

Negotiation Roleplay

Code	B 6
Teaching topic	Negotiation Role Play of an international river basin
Time (hrs)	11
Content/Skill focus	Negotiation Role Play of an international river basin
Objectives	- To get exposed to a situation of conflicting interests - To apply communication, mediation and negotiation techniques to a case - To apply concepts related to IWRM and international water law to a case - To work in a team.
Learning methodology	Interactive roleplay, based on the Incomati river basin, as at 1990; Participants have individual and country briefs
Trainer/facilitator guide	The roleplay is divided in the following stages: - briefing (plenary; self study) - country delegations prepare secret strategic papers - trilateral session - various unilateral, bilateral and trilateral sessions - formulation and signing joint statement - debriefing of roles - evaluation
Course book	6.1 General instruction and game rules 6.2 Background document I: “Incomati river basin; 1990”
Hand outs	6.3. Country briefs and individual briefs; 1990 6.4 Background document II: “Incomati river basin; 2001” *(only if second round is played, or after the end of the play)* 6.5 Country briefs and individual briefs; 2001 *(to be developed)* 6.6 Background document III: “Incomati river basin; 2002” *(after the end of the play)*
Software	Incomati water resources management model; computer model for scenario evaluation (base model; version 0.0) *(under construction)*

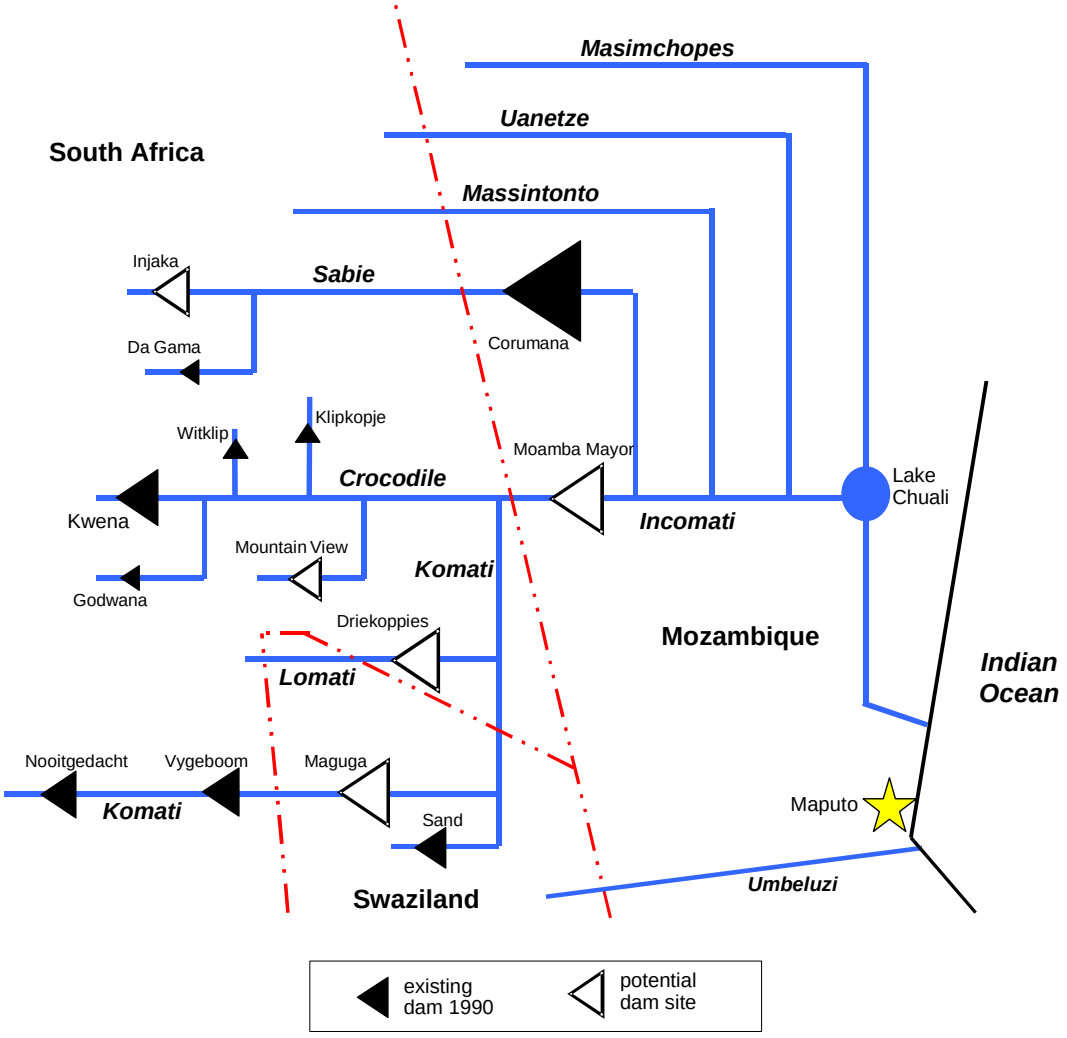
Incomati Basin Negotiation Roleplay

General instruction and game rules

Draft, 13 November 2002

Objectives

- To get acquainted with a situation of conflicting interests, and how to deal with it.
- To work in a team.
- To be exposed to a process of negotiation, and making deals.
- To apply concepts related to IWRM and international water law to a real-life case.



Sketch of the Incomati basin with major existing and proposed dams, as at 1990

The Roleplay

1 The Context

It is the year 1990. South Africa and Mozambique both seem to start coming out a dark period of 15 years of political turmoil. Swaziland appears to have been, during this period the only stable factor.

As is indicated in the background paper to this roleplay ("The Incomati river basin; 1990"), these three countries share the Incomati river, which is economically important to all three states. Since the late 1960s, the riparian countries have held meetings to discuss matters of mutual interest. A formal platform, Tripartite Permanent Technical Committee (TPTC) was established in 1982, and advises the governments. (The TPTC also deals with the Maputo river basin, the other basin shared by the three countries.)

In this committee, country delegations meet more or less regularly, with each delegation consisting of 3 to 5 government officials. The venue of the TPTC meetings rotate among the three countries. Each meeting is chaired by the head of delegation of the country hosting that particular meeting.

Since the early 1980s, Swaziland and South Africa have held numerous bilateral meetings (outside the TPTC) in order to discuss development plans to develop the Komati river, which is part of the Incomati river basin.

Swaziland and South Africa now want to go ahead with their joint Komati Basin Development Plan. Immediately after the 8th TPTC was held in Maputo (21 March 1989), South Africa formally wrote a letter to the Mozambican Minister of Foreign Affairs requesting Mozambique's no objection for the construction of Driekoppies dam (in accordance with general international diplomatic practice and with the Helsinki Rules of 1966). Mozambique responded in an official note signed by the Minister, stating some conditions, the most important being a water sharing agreement on the Sabie, and a guaranteed minimum flow in the Incomati at Ressano Garcia.

As a result of this correspondence, South Africa asked the TPTC to meet. This 9th TPTC meeting is scheduled to be held in Pigg's Peak, Swaziland.

Further technical and other relevant details can be found in the background paper.

2 The Problem Statement

The Incomati river basin holds the key for the development challenges of both Swaziland, South Africa and Mozambique. Each of the country delegations attempts to find that option for developing the Incomati water resources that suits that country best. (A list of the composition of the country delegations is given on page 6-8.)

In addition, SADC will sent a SADC Facilitation Team, consisting of two renowned SADC experts.

Because of bilateral and multilateral agreements and international conventions, it is imperative that an agreement be reached or minimally a joint statement be issued by all

three countries, as well as the SADC Facilitation Team, about how best the Incomati water resources can be used/protected/developed.

3 The Assignment

You will be assigned the role of one delegate (see list of all stakeholders on p. 4).

1. Study your own position and interests. Re-read the Incomati background paper.
2. Agree with your country delegation about the positions you wish to take during the negotiation. The result is a written Secret Country Position Paper outlining your country's interests in the Incomati water resources. The two members of the SADC Facilitation Team also formulate their Secret Facilitation Position Paper.
3. Through negotiations with the other country delegations, arrange a deal that serves your interests and/or that is acceptable to you.
4. The outcome is a written joint statement signed by all delegates, including the Facilitation Team.
5. The outcome of the negotiations is presented to the press in a joint press statement.

4 The Procedure

All countries have agreed to the proposed facilitation team from SADC.

Each delegate gets (a) a country brief / facilitation brief and (b) an individual brief.

The first step in the role play is that each delegate studies his/her country and individual briefs, and defines his/her position and interest.

The second step is that each country delegation, as well as the Facilitation Team, carefully and thoroughly prepare the negotiation. This is summarised and written down in a Secret Position Paper.

In the Secret Position Paper (a 1-2 paged document), each delegation defines its interests in the water resources of the Incomati River Basin and its uses.

A copy of the Secret Position Paper should be made available to the roleplay observers before the negotiations start.

The facilitation team draws up a Process Paper in which it sets out how it will facilitate the negotiation process.

A copy of the Process Paper should be made available to the role play observers befor the negotiations start.

The Secret Position Papers of each country delegation forms the starting point in the negotiation process.

The Role Play starts with the 9th TPTC meeting, held at Pigg's Peak in Swaziland.

The roleplay ends on Friday 15 November 10:00 AM SHARP with a "press conference" in which the parties brief the press about the outcome of the negotiations.

5 Scenario / Time schedule

Time	Step	Task
BRIEFING (day # 8, Wednesday evening)		
Wednesday 16:30-17:00	Plenary briefing of participants	Introduce role play: Role play rules; process; time frames Organisational arrangements Hand out: briefing documents to teams
Wednesday evening	Participants read carefully background document	
FIRST DAY (day #9, Thursday)		
Thursday 09:00-10:00	Question and answer session on Incomati	
Thursday 10:00	**Roleplay starts**	
Thursday 10:00-13:00	Role play	
Thursday 13:00-14:00	Lunch	
Thursday 14:00-17:00	Role play	
Thursday 17:00-17:30	Delegations return to St Georges Hotel	
Thursday 17:30-late	Delegations proceed with roleplay at St Georges Hotel Supper provided at St Georges Delegates are not supposed to leave the Hotel	
SECOND DAY (day #10, Friday)		
Friday 08:30-09:00	Delegates are transported back to the Vineyard Hotel	
Friday 09:00-10:00	Delegates proceed with roleplay at Vineyard	
Friday 10:00-10:30	Press conference; Facilitator team present joint statement by the three parties	Delegations conduct a formal internal meeting Consultations of mediators with negotiating teams
Friday 10:30	**End of roleplay**	
Friday 10:30-11:00	**Analysing outcome of roleplay; observers with participants**	
Friday 11:00-11:30	**Evaluation of roleplay by participants**	

6 Some final observations

The outcome of the role play MUST be a written agreement or written joint statement signed by all delegates.

The indicated time schedule may not be exceeded.

Every player may once (and only once during the entire play) ask for a 5 minute Time Out, in order to hold some side negotiations. A Time Out is indicated by waiving the yellow card, and handing it to the roleplay facilitators.

The role of the roleplay observers is only to ensure that each session begins and ends in time, and that Time Outs are granted.

Coalition forming (and breaking) is allowed at any moment; and between any delegates.

At the end of the Roleplay, the outcome is evaluated against each delegation's Secret Position Paper and the Process Paper.

7 The Delegates

Mozambique	**South Africa**	**Swaziland**	**Facilitation team**
Official Ministry of Foreign Affairs Mozambique	Official Ministry of Foreign Affairs South Africa	Official Ministry of Foreign Affairs Swaziland	SADC Facilitator (Lawyer) Gaborone, Botswana
Official Ministry of Water Mozambique	Official Ministry of Water South Africa	Official Ministry of Water Swaziland	SADC Facilitator (Hydrologist) Gaborone, Botswana
Official Ministry of Environment Mozambique	Official Ministry of Environment South Africa	Official Ministry of Agriculture Swaziland	
Official Ministry of Finance Mozambique	Official Ministry of Finance South Africa	Official Ministry of Finance Swaziland	
Official Ministry of Commerce Mozambique	Official Ministry of Agriculture South Africa	Official Ministry of Environment Swaziland	

Incomati Basin Negotiation Roleplay

The Incomati river basin, 1990

Background document I

Compiled by Pieter van der Zaag, UNESCO-IHE Delft & University of Zimbabwe

1. Natural characteristics

Physical geography and climate of the basin

The Incomati River basin is located in the south-eastern part of the African continent and covers a land area of about 46,700 Mm^2. It occupies 2,500 Mm^2 (5%) of the Kingdom of Swaziland, 15,600 Mm^2 (33%) of the Republic of Mozambique and 28,600 Mm^2 (61%) of the Republic of South Africa. The Basin consists of six main rivers, viz. Komati, Crocodile, Sabie, Massintonto, Uanetze and Masimchopes, which join the main stem of the river known as the Incomati (which is formed at the confluence of the Komati and Crocodile rivers at the border between South Africa and Mozambique at Komatipoort/Ressano Garcia). The Incomati empties in Maputo Bay in the Indian Ocean (Figures 1.1, 1.2).

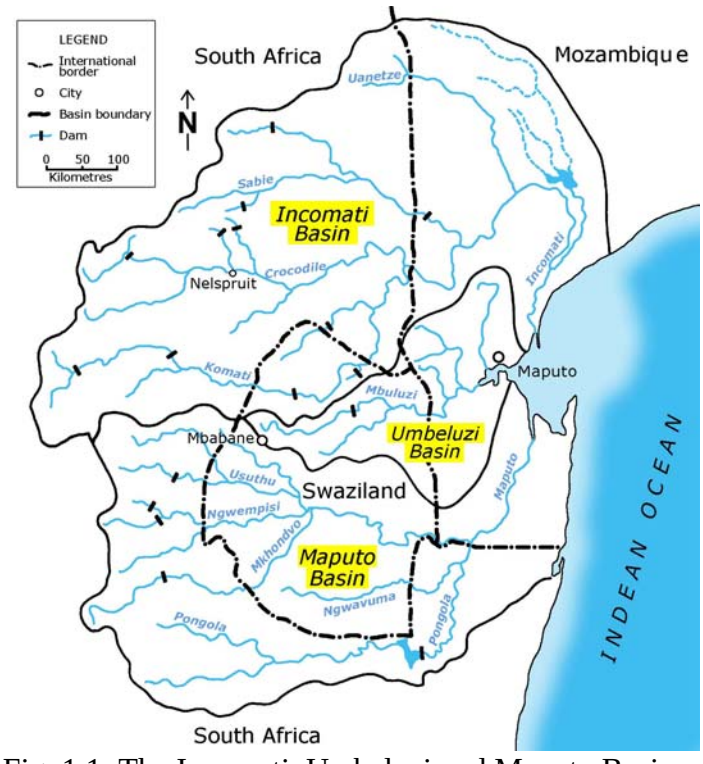


Fig. 1.1: The Incomati, Umbeluzi and Maputo Basins, discharging in Maputo Bay

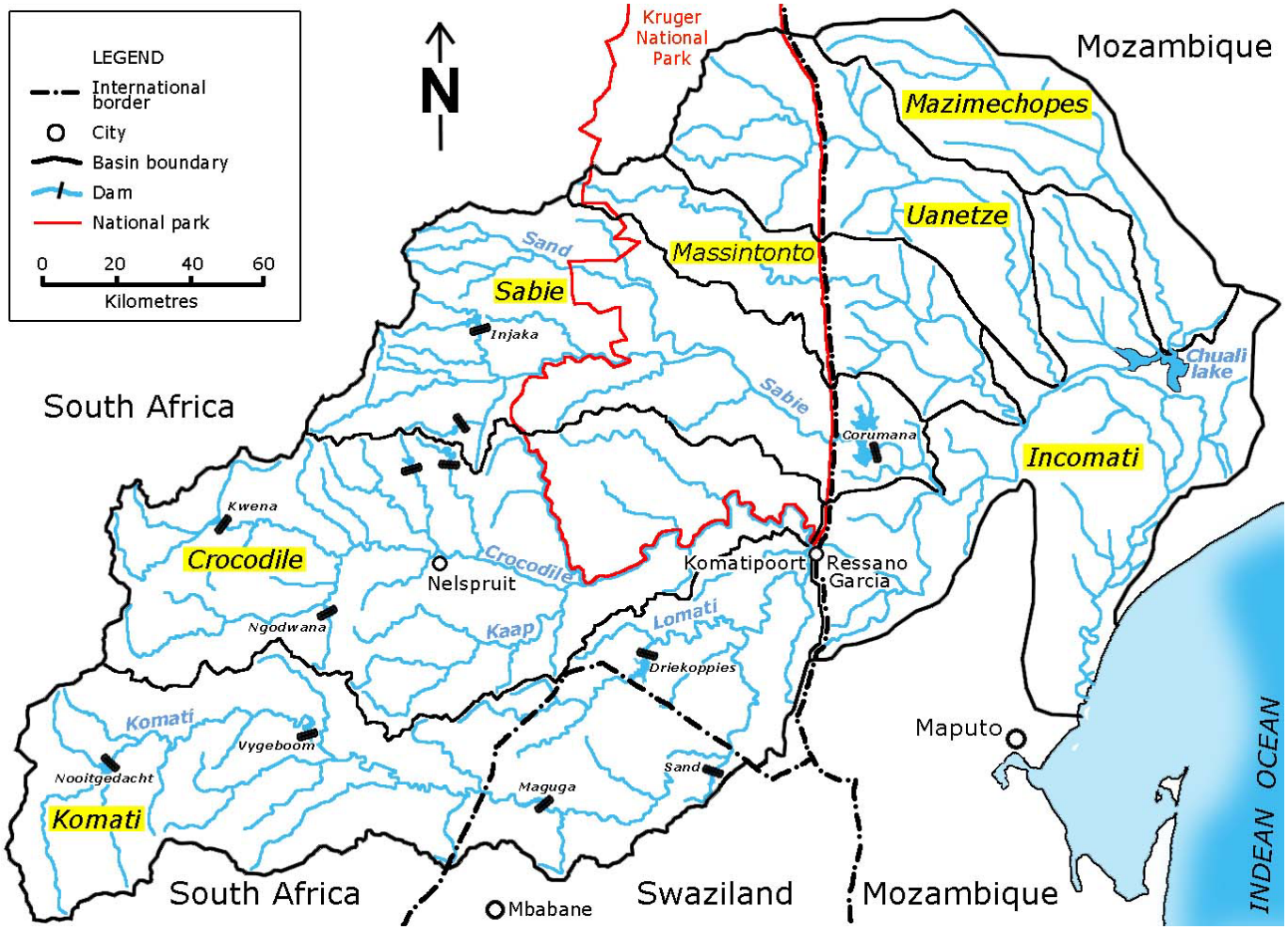


Fig. 1.2: The Incomati Basin

The Incomati River basin rises in the mountains and plateaux above 2,000 metres above sea level in the west of the basin and drops to the homogeneous flat coastal plain to the east of the Lebombo mountains at elevations below 150 m. The general climate in the Incomati River basin varies from a warm to hot humid climate in the Mozambique Coastal Plain and the Lowveld to a cooler dry climate in the Mpumalanga plateau and South African Highveld in the west. The entire basin falls within the summer (October-March) rainfall region with a mean annual precipitation of about 736 mm/a, which generally increases from east to west (Figure 1.3). The highest precipitation occurs in the upper Sabie (around 1,200 mm/a). The mean annual potential evaporation for the basin as a whole is 1,900 mm/a, which generally decreases from east to west.

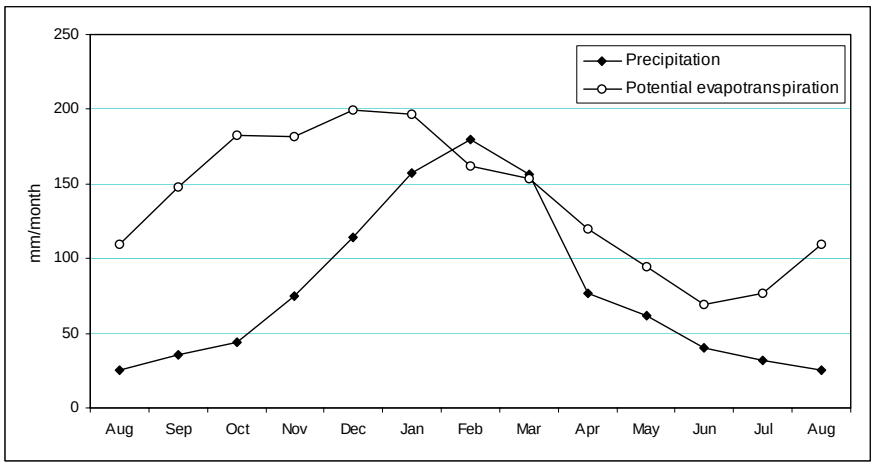


Figure 1.3: Average precipitation and potential evapotranspiration, Macia, Mozambique

Hydrology

The net virgin runoff of the Incomati River basin averages 3,587 Mm^3/a (Tables 1.1 and 1.2), and the consumptive water use in the year 1990 was about 1547 Mm^3/a, including consumptive use of exotic forest plantations (see below). Total consumptive water use was therefore 43% of the virgin runoff. This level of commitment is high and frequently leads to water shortages, given the high variability of flow (Figures 1.4 and 1.5).

Table 1.1: Water generation in the Incomati basin (source: JIBS II, 2001)

Catchment	Catchment area	Virgin discharge	
	Mm^2	Mm^3/a	mm/a
Komati	11,209	1,420	127
Crocodile	10,468	1,226	117
Sabie	7,048	750	106
Massintonto	3,429	22	6
Uanetze	3,932	14	4
Masimchopes	3,970	21	5
Incomati	6,692	134	20
Total	46,748	3,587	77

Table 1.2: Water generation in the Incomati basin (source: JIBS II, 2001)

Country	Catchment area		Virgin discharge	
	Mm^2	%	Mm^3/a	%
South Africa	28,556	61	2,937	82
Swaziland	2,545	5	479	13
Mozambique	15,647	33	171	5
Total	46,748	100	3,587	100

Within the hydrological year (October-September), some 80% of all runoff occurs during the months November-April. Variations of discharge from year to year are significant, with a coefficient of variation of around 50-65%. Floods occur, as well as droughts. During the four year period starting in October 1991, average annual runoff at Ressano Garcia was only 12% of the long-term average measured over 1952-1979. During the recent floods of February 2000, a small catchment area in the Sabie river had a peak discharge of 700 mm/day (Smithers et al., 2001).

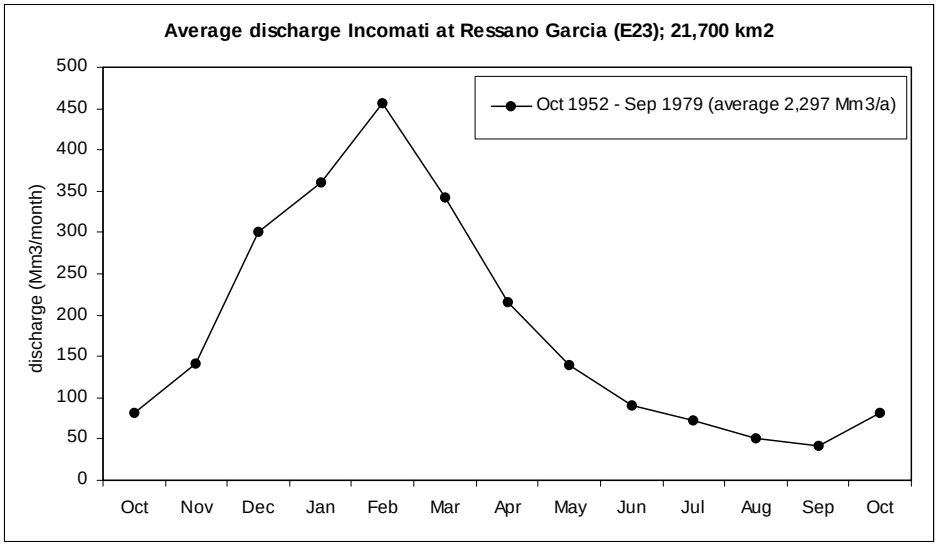


Figure 1.4: Average monthly discharge at Ressano Garcia (gauging station E23); 1953-79

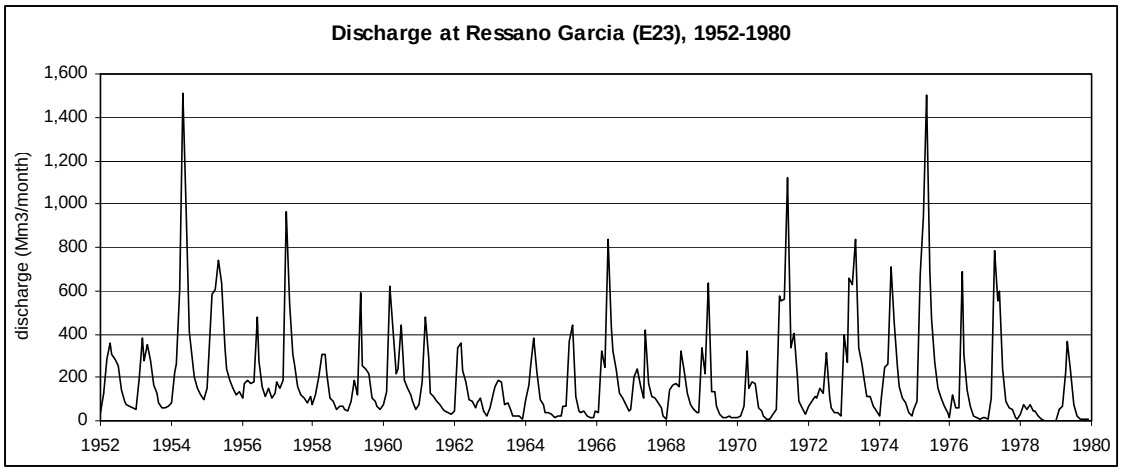


Figure 1.5: Monthly discharge at Ressano Garcia (gauging station E23); 1952-1980

Natural flora and fauna dependent on water resources

The Incomati provides habitats for a rich variety of species, including those classified as threatened. At least 40 threatened bird species, 11 threatened terrestrial mammal species, 12 threatened fish species and 8 threatened reptile and amphibian species occur in the basin, all (partly) dependent on water and/or riverine vegetation. In addition to these about 104 threatened plant species are found in the basin. Some species provide essential economic and social services, including to the poor.

There are many areas of particular conservation importance within the basin. The most famous is the Kruger National Park. The conservation status of the main rivers in South Africa has been described as modified but primarily natural to largely natural with few modifications. The exceptions are the completely altered areas along the middle Crocodile River and the lower Komati and Lomati Rivers and some tributaries of the Sabie River. In Swaziland the conservation status of the rivers is considered close to natural for most stretches. In Mozambique, the flow regime of the main stem of the Incomati has been altered significantly due to upstream abstractions.

The most important anthropogenic changes in river environment are caused by dams and reservoirs, water abstractions from these, and interbasin transfers. The resulting modified river flow regime affects structural and functional attributes of the biotic communities.

The Incomati estuary is an important sanctuary for breeding colonies of aquatic birds and provides water and other ecological services to local populations. The estuary has an extensive mangrove forest covering approximately 5,000 ha around the mouth area, The mangrove forests protects the coast from erosion provoked by the prevailing easterly winds. The positive relationship between mangrove areas and production of valuable fish and prawns is well documented. Mangroves at the estuary have suffered anthropogenic impact and large areas are being harvested for construction, charcoal production and fire wood.

The direct effect of freshwater in an estuary is to reduce the water salinity and increase nutrients supply (from sediment deposition) for the primary productivity of the estuarine ecosystems, namely mangroves and reed beds. Upstream abstractions have reduced freshwater flows into the estuary and changed the flow regime. This may negatively affect the estuarine ecosystem and consequently the shrimp and fish production in Maputo Bay. It is not precisely known what the minimum water requirement of the estuary is. The minimum flow of water required to control salt-intrusion has been estimated at between 1.5 m^3/s (Euroconsult, 1989) and 5 m^3/s (JIBS, 2001).

2. A short political history of the Incomati basin

The Incomati basin is not only a system of watercourses that are interconnected; the basin also encompasses a space that is of significance in terms of culture, history, politics and economy, encompassing parts of southern Mozambique, northern

Swaziland and eastern South Africa. It also includes Maputo Bay in the Indian Ocean, which is shared by other rivers such as the Umbeluzi and the Maputo.

According to Newitt (1995) the Bay has deeply influenced early developments in south-eastern Africa, as people settled round its shores and along its rivers. Its people engaged in activities such as fishing, hunting whales, trading ivory, and maintaining an economy of cattle-keeping and agriculture. The influence of the Bay stretched across the Lebombo mountains to the interior, for instance through the trade of copper. The first Europeans to arrive were the Portuguese, who during some 200 years focused on ivory trade. Most ivory had to be brought from considerable distances, and deepened and expanded the long-distance commercial networks to the hinterland.

Towards the end of the 18th century, the bay was a hive of activity, with the Portuguese and British having established trading posts. The city of Lourenço Marques was founded in 1790. In the 19th century, it became "the major trading port for the Swazi and Zulus, for the Tsonga chieftainships to the north and, after the Great Trek, for the Transvaal Boers as well." (Newitt, 1995: 293)

The discovery of important minerals in the Transvaal area during the second half of the 19th century reinforced the emerging regional economy. The enormous mine developments required an intensive support network in terms of transport, communication, agriculture, trade and labour. Lourenço Marques with its harbour was strategically positioned. The construction of a railway connecting this city to Johannesburg, and passing through Ressano Garcia where the Komati and Crocodile rivers join and form the Incomati, was completed in 1895 (Libby 1987).

Despite the thread of malaria, pockets of European agriculture emerged along the river valleys of the Crocodile river near the towns of Barberton and Nelspruit. White settlement increased rapidly in the lowveld of the South African part of the Incomati basin after World War I. Major crops cultivated were citrus, cotton and tobacco (Packard, 2001: 596-598). During the same period, irrigation development started in the Incomati plains. The sugarcane plantation and sugar mill at Xinavane in Mozambique were established around 1910 by a British owned company.

By 1952, some 250,000 Mozambican workers stayed in South Africa, of which only 100,000 legally (Coles and Cohen, 1977). In 1967, the earnings by these Mozambican migrant workers was estimated to be 8 times the value of marketed agricultural produce of southern Mozambique (Coles and Cohen, 1977; Murteira 2000).

The swift decolonisation of the continent in the 1960s drove Portugal and South Africa closer together. This is most clearly demonstrated by the construction of the massive Cahora-Bassa dam on the Zambezi. This project was a joint venture in which the Anglo American Corporation had a strong interest as well as Portuguese capital. A generous concession was given to Eskom, the South African electricity company, which would buy the electricity generated by the dam (Minter 1977). This electricity was seen as crucial for the further economic development of the Transvaal (Cliffe 1976; Minter 1977).

Around 1950 agricultural development in the Incomati basin increased significantly. In the lowveld of the South African part of the Incomati basin, DDT was introduced in 1945 in order to control malaria (Packard 2001). This led to the 'opening up' of the area for commercial farming, and the forced removal of black farmers from areas designated for white farmers (Mather, 1992). The KgaNgwane “homeland” along the lower Komati was created. Transvaal Suiker Beperk (TSB) started to develop irrigated sugarcane from 1965 onward along the Crocodile river, and constructed Malelane sugar mill. A paper mill was constructed in 1966 in the upper parts of the Crocodile river (Ngodwana). In 1960 Swaziland started to establish sugar plantations along the Umbeluzi river (adjacent to the Komati) with support from the Commonwealth Development Corporation CDC. In the Incomati plain the area cultivated with sugarcane increased both at Xinavane and at Maragra. New Portuguese settlers started to cultivate irrigated rice.

Swaziland attained Independence in 1968. Mozambique followed in 1975 as a result of the collapse of the Portuguese colonial regime in 1974. South Africa increased its military budget, and started to destabilise Mozambique by supporting Renamo. By 1983 the countryside in southern Mozambique had become unsafe, and many rural people had to find refuge around Maputo. At the end of 1983, South Africa signed with Swaziland a secret non-aggression pact. In the midst of the insurgent activities, negotiations started between Mozambique and South Africa, which culminated in the signing of the Komati Agreement in March 1984. The Komati agreement did not have the intended effect. A further increase in politically motivated violence within South Africa triggered a flight of capital and the Rand lost half of its value (Beinart 1994: 241). Rather than decrease, destabilising activities by Renamo increased and developed into a fully-fledged civil war. The death of Samora Machel, in an unexplained plane crash in December 1986, shocked the world. It was only after Nelson Mandela was released from prison in February 1990, that the political atmosphere improved. In the same year the Mozambican government introduced a new constitution that provided for multi-party democracy, and started negotiations with Renamo.

During this period, irrigation areas in the South African parts of the Incomati basin increased rapidly, in the context of subsidies to white commercial farmers. Afrikaner capital (the Rupert family with their Rembrandt group of companies, as well as the Development Bank of Southern Africa and its chairman Simon Brand) was instrumental in further developing sugarcane cultivation along the Crocodile and Lomati rivers in South Africa. Swaziland commissioned a second sugar mill on the Umbeluzi and started to draw water for its sugarcane from the Komati. In Mozambique new irrigation infrastructure was established, for instance the Sábie-Incomati irrigation scheme (3,500 ha), but actual area irrigated dropped because of the civil war.

3. Socio-economic characteristics of the Incomati basin

Despite its economic significance, the Incomati basin has no major urban developments. The nearest large city is Maputo, which lies just outside the basin, but shares the same estuary. Many smaller towns exist, such as Eerstehoek, Kamaqhekeza, Komatipoort, Ngodini, Malelane and Sabie in South Africa, Pigg's Peak in Swaziland, and Moamba,

Magude, Manhica and Marracuene in Mozambique. It is estimated that currently 2 million people reside in the basin.

The basin provides an important transport and communication axis between the Gauteng area and the Indian Ocean, but mining activities are relatively small (coal in the upper Komati and some small scale gold mining in the Crocodile and Sabie areas).

Agriculture and forestry form the mainstay of the economy in the basin and both sectors are the largest water users. Two crops dominate the basin, both in terms of land and water use and economy: rain-fed commercial tree plantations (some 340,000 ha), and irrigated sugarcane cultivation (31,400 ha) and the related sugar industry. Sugarcane production in the basin captures as much as 50% of all water used for irrigation, provides employment to a large labour force (some 30,000 directly employed), and generates between US$ 50-100 million per year. Sugarcane processing in the Incomati basin is in the hands of few players. The three companies active in the Incomati also dominate the South African sugar market (Table 3.1).

Table 3.1: Sugar mills in the Incomati basin, 1990 *

Mill	Country	Capacity (ton/a)	Owner
Malelane	South Africa	200,000	Rembrandt
Xinavane	Mozambique	50,000	Mozambique government/banks
Maragra	Mozambique	100,000	Mozambique government

** Mhlume and Simunye mills in Swaziland, located in the Umbeluzi basin, have been omitted.*

Dam development

By 1960 water use of the Incomati was still modest, and no major dams existed. However, developments were going fast and the first ideas for further water development had crystallised. Swaziland commissioned in 1966 the first major dam in the Incomati, the Sand River dam in the Komati river (49 Mm^3). in order to develop irrigated sugar cane. Five years later South Africa constructed the Vygeboom dam (capacity 84 Mm^3, commissioned in 1971), located on the same river but upstream of Swaziland.

Mozambique already had extensive irrigation works established. An estimated 5,000 ha of maize, vegetables, potatoes and citrus were irrigated at Moamba, Magude and Manhiça. In addition, the sugar companies at Xinavane and Manhiça (Maragra) irrigated about 12,000 ha of sugarcane, which produced around 80,000 tons of sugar in 1970, or a quarter of Mozambique's total sugar production (Wuyts, 1989; Hanlon, 1984). These estates irrigated their crops through off-river pumping. This was feasible since the natural minimum flow of the lower Incomati, until that time, seldom dropped below 10 m^3/s. Moreover, Mozambique had ambitious plans to build major storage dams on the Incomati near Moamba (Moamba Mayor) and the Sabie (Corumana).

During the period 1972-1981, four relatively small dams were built, all in South African territory. Total storage capacity in the entire Incomati basin was more than doubled by the Kwena dam on the Crocodile (155 Mm^3), commissioned in 1982, and Nooitgedacht dam (75 Mm^3) on the Komati (upstream of Swaziland), commissioned in 1983. Both

dams increased the total storage capacity in the basin to some 430 Mm^3, of which 89% in South Africa, and nil in Mozambique.

By 1988 South Africa and Swaziland on the one hand were making progress with their development plans, while Mozambique unilaterally implemented its own, on the other. Mozambique commissioned the biggest dam on the Incomati, Corumana dam (850 Mm^3) on the Sabie river, tripling the total storage capacity in the basin to 1,340 Mm^3 (Table 3.2). In the same year it completed Pequenos Libombos dam (400 Mm^3) in the Umbeluzi basin (neighbouring the Incomati basin), meant to secure Maputo's water supply.

Table 3.2: Major dams (> 10 Mm^3) in the Incomati, 1990 (source: JIBS II, 2001)

Tributary	Country	Major dam	Year commissioned	Storage capacity (Mm^3)
Komati	South Africa	Nooitgedacht dam	1962	81
Komati	South Africa	Vygeboom dam	1971	84
Komati	Swaziland	Sand River dam	1966	49
Crocodile	South Africa	Kwena	1984	155
Crocodile	South Africa	Witklip dam	1979	12
Crocodile	South Africa	Klipkopje dam	1979	12
Sabie	South Africa	Da Gama dam	1979	14
Sabie	Mozambique	Corumana dam	1988	879

Consumptive water uses in the basin

By 1990, consumptive use of surface water amounted to 43% of the average amount of surface water generated in the basin, which is considered relatively high (Table 3.3). The major water consumers are the irrigation and forest plantation sectors, followed by inter-basin water transfers. These represent 93% of all consumptive water uses. Other water uses include domestic, municipal and industrial use as well as water for livestock and game.

Table 3.3: Consumptive water use (Mm^3/a) as at 1990 in the Incomati basin (source: after JIBS II, 2001)

Country	Domestic & municipal	Industry	Livestock & game	Forest plantations	Irrigation	Inter-basin transfer	Total	%
South Africa	55	21	8	403	594	131	1,212	78
Swaziland	4	0	2	41	47	136	229	15
Mozambique	3	11	1	7	84	0	106	7
Total	61	32	11	450	725	267	1,547	100
%	4	2	1	29	47	17	100	

Domestic and municipal water use

Water consumption of the 2 million people living in the basin only represents 4% of total consumptive water use, and only 2% of average water generation. It is expected that with increasing population and increasing economic development, water use in this sector will increase rapidly. The city of Maputo, which is located adjacent to the

Incomati basin, will soon require water from the Incomati to supplement its current source from the Umbeluzi river. This may more than double water use of this sector.

Industry
Major industries not located in urban centres are the SAPPI paper mill at Ngodwana and the TSB sugar mill at Malelane, in South Africa; and the Xinavane and Maragra sugar mills and the textile factory at Marracuene, in Mozambique.

Rain-fed agriculture
Rain-fed agriculture is widespread throughout the basin. This type of agriculture uses rainfall directly, and is in this sense one of the largest water users. Compared to the natural vegetation, the use of rainfall is in the same order of magnitude, except for exotic tree plantations.

Exotic tree plantations (afforestation)
Extensive areas of exotic tree plantations occur mainly in Swaziland and South Africa, and are entirely rain-fed. They consume large quantities of water from rainfall, and thereby alter the natural hydrology such that runoff is significantly reduced. The exotic afforestation in both Swaziland and South Africa are therefore controlled by means of a permit system. The existing exotic afforestation in Mozambique is negligible (Table 3.4). It is estimated that the total afforestation areas in South Africa and Swaziland cause a flow reduction of about 443 Mm^3/a, i.e. equivalent to 130 mm/a.

Table 3.4: Exotic tree plantations in the Incomati basin (ha) (source: JIBS II, 2001)

Country	Established (1991)
Mozambique	2,400
South Africa	310,000
Swaziland	29,400
Total	341,800

Irrigation
Irrigated agriculture is the largest user of surface and groundwater in the Incomati. The area presently being irrigated is estimated at 81,400 ha, consuming 725 Mm^3/a of water (Table 3.5). In addition, by 1990 Mozambique had 17,600 ha of lands with irrigation infrastructure lying idle because of the civil war. Moreover, all three countries had immediate plans to expand the irrigated area with 19,400 ha in the short term. In the short term, therefore, at least 300-350 Mm^3/a of additional water is required. All countries also have ambitious plans for the longer term plans, namely to add a further 74,800 ha irrigation. These long term plans would require an additional 780 Mm^3/a of water. JIBS II (2001) has calculated that the latter amount of water is not available.

Table 3.5: Irrigated area in the basin (ha) (source: after JIBS II, 2001)

Country	Irrigated area (1991)
Swaziland	4,500 *
Mozambique	7,400
South Africa	69,500
Total	81,400

** excluding 9,500 ha in the Umbeluzi basin irrigated with Incomati water*

The dominant irrigated crop in all three countries is sugar cane. The established 31,400 ha covers 39% of the entire irrigated area. Other dominant crops include orchards, summer grains and winter vegetables (see Table 3.6).

Table 3.6: Estimate of irrigated crops in the Incomati basin (1991) (ha) (source: after JIBS II, 2001)

	Mozambique	South Africa	Swaziland	Total
Perennial crops				
Orchards	200	19,700	1,200	21,100
Bananas	200	7,100	0	7,300
Sugar cane	3,700	24,800	2,900 *	31,400
Pasture	0	2,800	0	2,800
Subtotal	4,100	54,400	4,100	62,600
Summer crops				
Summer grain	2,000	7,800	400	10,200
Summer vegetables	1,100	2,900	0	4,000
Tobacco	0	4,400	0	4,400
Rice	200	0	0	200
Subtotal	3,300	15,100	400	18,800
Winter crops				
Winter grain	1,000	2,300	0	3,300
Winter vegetables	500	4,250	200	4,950
Subtotal	1,500	6,550	200	8,250
Total annual irrigated	8,900	76,050	4,700	89,650
Total area with irrigation	7,400	69,500	4,500	81,400
Irrigation intensity (%)	120	109	104	110

** excluding 9,500 ha in the Umbeluzi basin irrigated with Incomati water*

Water transfers

Surface water is being exported from the Incomati to neighbouring basins. This type of consumptive water use represents the third largest water use in the basin, after irrigation and water consumption by exotic tree plantations. Two bulk water transfers exist in the Incomati River basin. South Africa exports 132 Mm^3/a from the upper Komati River catchment essentially for thermal power generation on the Transvaal Highveld in the Olifants catchment, part of the Limpopo basin. Swaziland exports 136 Mm^3/a from the Komati River in Swaziland, mainly for irrigating sugar cane in the Umbeluzi basin.

Other water uses

Some of the dams generate hydropower, but all such dams have as their primary purpose to provide water for other sectors. Electricity production is therefore a secondary benefit derived from water releases made to other users. Water is also required to maintain the riverine ecosystems. These requirements, which have been estimated for the first time by JIBS (2001), appear fairly high and will, if adhered to, constrain other water uses (Table 3.7).

Table 3.7: Environmental water requirements, Incomati (annual values of a seasonally varying flow) (source: JIBS II, 2001)

River stretch	Environmental water requirement (Mm^3/a)
Komati River, just downstream of the Vygeboom dam	4
Komati River, upstream of the confluence with the Lomati River	104
Lomati River, downstream of the Driekoppies dam	26
Komati River, downstream of the Maguga dam	84
Incomati River after the confluence of Komati and Lomati Rivers	140
Incomati River after the confluence with the Crocodile River (Ressano Garcia)	471
Sabie River, downstream of Corumana Dam	129
Incomati River, at the estuary	642
and a minimum flow of *	5 m3/s *

** Minimum flow required in the estuary to control salt-water intrusion.*

Recent trends

Water use is high in the Incomati basin. As a result, certain parts of the basin experience severe water stress during certain periods of the year, and during years with below normal rainfall and runoff. Figure 3.1 compares the average runoff pre- and post-1980 for the Incomati near Ressano Garcia in Mozambique, just after the confluence of the Komati and Crocodile. Average runoff measured during 1980-1999 is less than half of that between 1953 and 1979. People in Mozambique have complained bitterly about the drying up of the Incomati. Further developments of water use in the three riparian countries clearly require coordination.

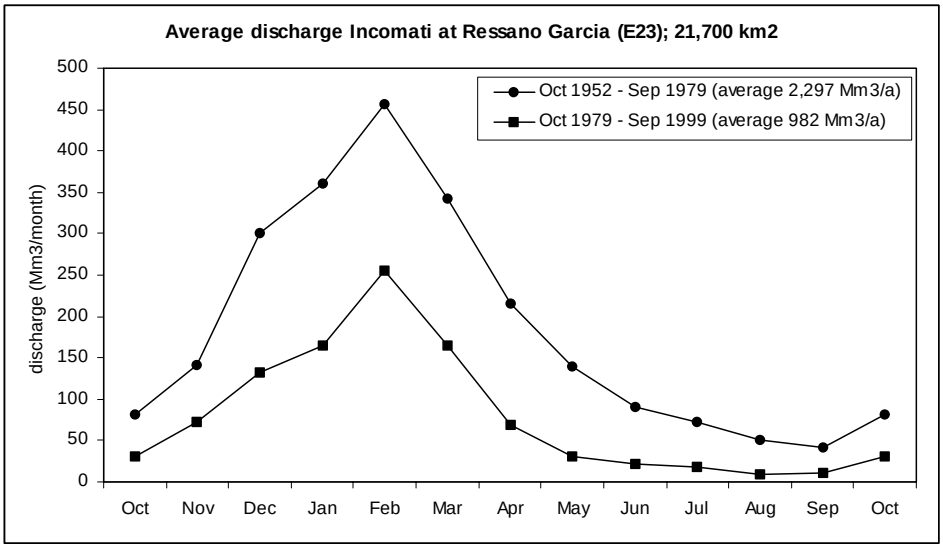


Figure 3.1: Average discharge of the Incomati at Ressano Garcia; 1953-79 and 1980-99

4. A preliminary history of water-related cooperation

4.1 The situation in the 1960s and 1970s: The first dams and formal contacts

The 1st Tripartite Technical Conference on Rivers of Common Interest between South Africa, Swaziland and Mozambique (the latter two still under colonial rule) was held in Mbabane, 24-25 April 1967, where it was agreed:

- To adopt the principle of "best joint utilisation";
- That Swaziland accede to Part I (Rivers of Mutual Interest) of the 1964 Cunene Agreement. The Cunene Agreement (Bipartite Agreement between South Africa and Portugal in regard to Rivers of Mutual Interest and the Cunene River Scheme) was signed on 13 October 1964;
- The full and free exchange of hydrological data;
- Studies to be done leading to an integrated plan for each of the shared river basins;
- Technical studies to be done for an international flood warning system.

The background of this meeting remains unclear. There is no evidence of serious droughts and floods prior to this meeting. In addition, during the 1960s water use of the Incomati was still relatively low, but significant. However, developments were going fast and new ideas for further water development had crystallised. Mozambique was working on an ambitious development plan for the Incomati, involving the construction of Corumana and Moamba-Major dam. Swaziland had just (in 1966) commissioned the first major dam in the Incomati, the Sand River dam in the Komati river (capacity 49 Mm^3) in order to develop irrigated sugar cane. This may have triggered the concern of South Africa and Mozambique. South Africa was about to construct the Vygeboom dam (capacity 84 Mm^3, commissioned in 1971), located on the same river but upstream of Swaziland.

Two follow-up conferences were held (in 1969 in Lourenço Marques, and in 1972 in Mbabane), but no progress on the preparatory studies was made. During the 1969 meeting, the three countries agreed that projections for water requirements in the year 2000 had to be made. However, at the meeting of 1972 no data on actual water use were shared. It was therefore agreed that the countries would make available such data by March 1973. During the same meeting, South Africa committed itself that it would not proceed with further developments in the Incomati basin without first consulting the other two riparian states.

During these initial meetings on the Incomati, Swaziland's main concern was a guaranteed minimum flow during the dry season in the Komati river. As a trade off it was prepared to forego the floods for storage in upstream South Africa (i.e. in Vygeboom dam). Swaziland accepted the recommendations by a technical committee, which set low flow levels to be guaranteed. The meeting of March 1973 never materialised. The next tripartite meeting was only held in 1982 (exactly 10 years after their last meeting), as the Tripartite Permanent Technical Committee (TPTC). However, in 1975 Mozambique decided to succeed to the old colonial Cunene Agreement.

The period 1972-1981

During the period 1972-1981, the three countries found it difficult to meet because of developments in Mozambique. After attaining Independence in 1974, relations with South Africa quickly deteriorated. However it is important to acknowledge that the three countries remained on talking terms with regard to the water resources of the Incomati (from 1982 to 1989, at least 8 official meetings of the TPTC were held).

Around 1976, a conflict emerged between Swaziland and South Africa on the Komati river. In the eyes of Swaziland, South Africa had reneged on the earlier agreement of maintaining a certain minimum flow in the Komati river at the border with Swaziland. Between 1978 and 1981, Swaziland and South Africa delegations formally met at least 11 times, negotiating the uses of the Komati river. Of these 11 meetings, 7 were of the Joint Permanent Technical Committee (JPTC), the bilateral counterpart of the TPTC.

During this flurry of meetings and negotiations the first ideas of a joint Komati Basin Development Plan were conceived. This Plan started as (and remained) a bipartite affair. Swaziland and South Africa would meet bilaterally many times to discuss the Plan (33 times, including those at Ministerial level, between 1982-1991).

During the period 1976-1980, Mozambique and Swaziland held talks on the Umbeluzi waters, on which Maputo depends. This resulted in the signing in 1976 of the so-called Umbeluzi Agreement, in which Swaziland committed itself of leaving 40% of the flow in the White and Black Umbeluzi in the river for use by Mozambique. These amounts were not gauged at the border between Swaziland and Mozambique, but well upstream of the Mnjoli dam (153 Mm^3) which was being constructed (completed in 1980). When in May 1979 the lowest flow ever in the Umbeluzi at the Mozambican side was recorded due to the filling of Mnjoli dam, and Maputo experienced severe shortages, both countries held successful negotiations in Maputo on respecting this bilateral agreement. After the talks the river flow significantly increased.

Given the political context of the time, it is most remarkable that even South Africa and Mozambique met twice in 1978, discussing issues related to shared waters. The first meeting was held on 8 May, and was discretely organised under the auspices of the CEO of the South African Railways. A month later, an official delegation of the South African Department of Water Affairs visited Maputo and met a delegation of the Direcção Nacional de Aguas (DNA).

By 1980, Swaziland and South Africa acknowledged that Mozambique was an interested party in the Incomati, and that its interests had to be taken into account. In February 1981 floods occurred in the Save, Limpopo, Incomati and Umbeluzi rivers. In the southern rivers floods were modest, but in the Limpopo and Save rivers extensive flooding occurred. In a subsequent meeting held in 1981 between representatives of Mozambique and South Africa on Inhaca island (off the coast of Maputo) issues related to flood management were discussed. The local newspaper in Mozambique excitedly spoke of "water diplomats" from South Africa and Mozambique meeting.

The few contacts that existed between Mozambique and the other two riparian countries centred around the exchange of hydrological information and plans for future

developments. Although hydrological information was shared more or less freely (which proved important during the floods of 1981 and 1984), there was great reluctance to inform each other frankly on actual water use and the plans for future development. In addition there was a considerable language gap.

4.2 The situation in the 1980s: Tensions in the basin

The year 1982 was a drought year. Many people in southern Mozambique died of starvation. Water levels in the Incomati basin were low. The sugar companies on the Incomati suffered severe crop losses. For the first time it was realised by many that the water resources of the Incomati were limited, and that the steadily increasing upstream uses directly impacted on downstream users.

When, after a 10 year lull, the fourth tripartite meeting between Mozambique, Swaziland and South Africa was held in Mbabane on 6 July 1982, the Incomati river, as measured at the border between South Africa and Mozambique, only carried a trickle (40 l/s) where it used to carry at least 6 m^3/s. It fell completely dry two months later in September 1982, the first time since recording started in 1953.

During this meeting the following was agreed:
- Mozambique recognised the 1964/1967 Rivers Agreement, accepting the agreement made by its former colonial power, Portugal;
- The Tripartite Permanent Technical Committee (TPTC) was formally established (this meeting would be known as the 1st TPTC meeting; whereas the formal agreement between the three governments establishing the TPTC was only signed on 17 February 1983 during the 3rd TPTC meeting in Pretoria);
- Agreement to prepare in the near future a report on 1972-1982 water developments in each country;
- In view of present developments, talks should start on the Incomati (rather than on the Maputo river, the only other river of common interest of the three countries).

Less than 2 months later the second TPTC meeting was held, now in Maputo (the venue would rotate among the three countries). By now, the drought was a fact. Mozambique expressed its concern about the lack of water in the Incomati during the dry season at the border. South Africa explained that due to upstream developments it was no longer possible to release water during the dry season. Both countries agreed that there was an urgent need to coordinate further plans of water development, and that they would exchange information on studies already undertaken. Reference was made to the Komati river basin development plan being formulated jointly by South Africa and Swaziland. Swaziland also faced water shortage and requested South Africa to release more water in the Komati River.

The 3rd and 4th TPTC meetings were held in 1983, and the 5th and 6th in 1984. The 7th TPTC meeting was first scheduled to be held in 1985, but was only held in 1989, five years later. Whereas the TPTC met 6 times during 1982-1984, the JPTC (Swaziland and South Africa) met 11 times in the same period.

The topics discussed during the 1983 and 1984 meetings all centred around the exchange of information. Mozambique asked South Africa to provide discharge data on the Komati and Sabie river near its border. South Africa obliged. Mozambique informed the other riparians that construction of the massive Corumana dam had started.

A more important issue was that Mozambique wanted to know what South Africa's and Swaziland's development plans were in the upstream part of the Incomati basin. South Africa and Swaziland first submitted short abstracts on their joint Komati basin development plans, but Mozambique wanted to see the full report. This was made available: the draft development plan of the Komati, as formulated by the JPTC, envisaged the construction of Driekoppies (South Africa) and Maguga (Swaziland) dams. The dams would "stabilise existing water use and allow for modest irrigation expansion". Mozambique expressed its satisfaction about this draft interim report.

For its part, Mozambique presented, during the 5th TPTC meeting (Maputo 27-28 February 1984), its "framework" report on the Incomati, inspired by article 5 of the Helsinki Rules (which provides a list of all factors to be taken into account when establishing "a reasonable and equitable share" of the water resources of an international basin). South Africa agreed with Mozambique's suggestion to formulate a single "framework" for the entire Incomati basin. In the next meeting (6th TPTC meeting, Berg en Dal, 30 August 1984), Swaziland and South Africa accepted Mozambique's Incomati report. But when, during the same meeting, Swaziland and South Africa submitted their joint report on the Komati, Mozambique observed that the format used differed from its "framework" document. Mozambique further observed that similar documents would have to be made for the Sabie and Crocodile rivers. South Africa promised to avail a preliminary report on the Sabie river to Mozambique.

An unrelated natural event reinforced the need for speedy information exchange, namely the Demoina flood that hit the lower Incomati in early 1984. During the 5th TPTC meeting (Maputo, 27-28 February 1984) the countries noted the difficulty in communicating flood warnings speedily because conventional communication systems failed. Swaziland and South Africa promised to explore satellite communication options. During the 6th TPTC Mozambique presented a report on the 1984 floods, and South Africa committed itself that in future occasions the South African Broadcasting Corporation SABC would transmit messages via TV and radio in case telephone links were destroyed, as well as by satellite communication via Portugal.

The period 1985-1991

During 1985 to 1988 the TPTC did not meet. In the same period, Swaziland and South Africa met at least 19 times, 14 times as a JPTC, and 5 times at ministerial level. South Africa and Mozambique only met at the highest level (in March 1984, P.W. Botha and Samora Machel signed the Komati Agreement, which focused entirely on immediate security issues, and not on water).

By 1988, while South Africa and Swaziland were making progress with their development plans on the Komati, Mozambique unilaterally commissioned the biggest dam on the Incomati, Corumana dam (850 Mm^3) on the Sabie river. In the same year it

completed Pequenos Libombos dam (400 Mm^3) in the Umbeluzi basin (neighbouring the Incomati basin), meant to secure Maputo's water supply.

Despite Mozambique's political and security problems, the TPTC met twice in 1989. The need for such a meeting was possibly necessitated by South Africa and Swaziland's urgent wish to proceed with the building of two new dams on the Komati river, in accordance with their joint Komati basin plan. The hydrological context of these meetings was that again the Incomati river fell dry in September that year.

The 7^{th} TPTC meeting (Mbabane, 21 Feb 1989) was characterised by a hardening of positions between the three countries. The 8^{th} TPTC meeting, held one month after, was one of tough negotiations. This was when probably for the first time the clashes of interests between South Africa and Swaziland on one hand, and Mozambique on the other, were made explicit.

South Africa announced that it intended to construct Driekoppies Dam as soon as possible, and Swaziland stated that it would make a final decision on the construction of the Maguga dam. South Africa stated that the purpose of Driekoppies and Maguga dams was to utilise floodwater not used by Mozambique. Mozambique retorted that it already experienced severe shortages, and that the JPTC Plan itself stated that "serious shortages of water are expected to occur along the Incomati river in Mozambique". Mozambique further accused South Africa and Swaziland of transferring Komati water out of the basin.

South Africa responded by maintaining that both dams would not substantially reduce the availability of utilisable water in Mozambique. Mozambique emphasised that the dry season flow coming to Mozambique at Ressano Garcia had decreased substantially over the last 20 years. With the proposed plans, upstream water use in South Africa and Swaziland would further increase from about 700 to 900 Mm^3/a (probably discarding water use by commercial forests) after implementing Phase One.

Mozambique finally stated that it wished to reach agreement on a division of the Sabie water first, and that it then would like to reach a general agreement on the entire Incomati basin. With Corumana dam on the Sabie river in place, it was in Mozambique's immediate interest to secure an uninterrupted supply, as the Sabie river still had excess water.

After the meeting, South Africa formally requested Mozambique's no objection for the construction of Driekoppies dam. Mozambique responded in an official note signed by the Minister of Cooperation, stating some conditions, the most important being a water sharing agreement on the Sabie, and a guaranteed minimum flow in the Incomati at Ressano Garcia.

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Constitution of UNESCO (excerpt)

London, 16 November 1945

The Governments of the States Parties to this Constitution on behalf of their peoples declare:

That since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed;

That ignorance of each other's ways and lives has been a common cause, throughout the history of mankind, of that suspicion and mistrust between the peoples of the world through which their differences have all too often broken into war;

That the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races;

That the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern;

That a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind…

International Hydrological Programme

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