

Topic 3.3

MANAGING AND PROTECTING WATER RESOURCES TO MEET HUMAN AND ENVIRONMENTAL NEEDS

International Commission on Irrigation and Drainage (ICID)

Working Group on Environmental Impacts of Irrigation, Drainage and Flood Control projects (WG-ENV)

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Theme	3: MANAGING AND PROTECTING WATER RESOURCES TO MEET HUMAN AND ENVIRONMENTAL NEEDS
Topic	3.3: Preserving natural ecosystems in catchments and coastal zones
Main question	<i>How can we sustain natural ecosystems under continuous hydrological and chemical pressures from outside caused by land development, water contamination and increasing scarcity of water resources?</i>
Related sub-questions	<i>Question 1: How to integrate and combine land development with ecologically sound and self-supporting natural ecosystems?</i> <i>Question 2: How to enforce international and national laws to protect and preserve natural ecosystems?</i> <i>Question 3: How to create broad public awareness and acceptance of the values and benefits of natural ecosystems?</i>
General introduction	The earth's ecosystems provide various services which are crucial for human well-being and economic development, e.g., supporting soil formation; providing food, freshwater or fuel; regulating floods, climate or diseases; serving educational purposes. As the Millennium Ecosystem Assessment has shown, ecosystems have seriously been changed in the past century. Although these changes have led to net gains in human well-being and economic development in some parts of the world, the gains have far too often gone hand in hand with deterioration of the ecosystem services. The sound functioning of ecosystems is actually under stress by water scarcity and/or chemical contamination. Stopping the further degradation of important services by ecosystems will demand policy changes. Natural ecosystems are specifically of interest in this paper. Within catchments, being part of a larger freshwater system, and in coastal areas with brackish to salt circumstances, the further existence of these areas is subject to discussion due to land development or reclamation. In order to provide soils for agricultural use, city planning, infrastructure, and housing, land use often is changed and natural

ecosystems disappear or suffer from stress.

Efforts are necessary on several political levels and the public opinion in favor of preserving natural ecosystems is the basis for a sustainable situation. Each society has to cope with balancing the water and land use budget, in order to have and maintain areas of different interest, both natural and cultural, rural and urban. It is useful to have enough diversity present to keep an area functioning ecologically sound in a sustainable way.

The following components are needed to enhance and realize preservation of existing natural ecosystems in catchments and coastal zones:

- Public awareness of values and benefits of natural ecosystems,
- Implementation of international legislation,
- Governance of ecosystem services under national legislation,
- Integrated instruments to balance competitive goals and targets concerning land development and exploitation of water resources (e.g., EIA, SEA),
- Command and control instruments, and
- Economic instruments.

Good and applied governance, including policy, e.g., on the status and protection of natural areas, and law enforcement, is the basis of the efforts to be made on several political levels at the same time, from national to local. In case one level is out and non-functioning, the preservation of natural ecosystems is at risk.

The growing human population is placing ever-greater demands on available freshwater supplies. In many parts of the world, available water resources will need to be further developed to grow food, support cities and industrial production, and generate electricity. Governments around the world have pledged to work together to provide adequate access to clean water, sanitation, and electricity for all of humanity. Irrigation and drainage activities are mainly to serve food production, to enhance control of flood risks, to provide areas to live in, and to provide an economic basis for people. It is increasingly in both space and time relevant that decision making in where to plan new and how to manage existing drainage and irrigation systems is done in an integrated and balanced way, in order to meet compromising interests. As a result of an integrated assessment, where economic, environmental, and management and development issues are addressed, a sustainable land and water resources management can arise. However, it seems that the preservation issue of natural ecosystems is subject to the will of government and public to protect these areas explicitly. It thus remains an a priori choice to keep these areas existing and alive.

Resulting Question 1: How to integrate and combine land development with ecologically sound and self-supporting natural ecosystems?

The incorporation of environmental considerations into water and land use planning policy, law, and institutions is the first step necessary. If this step fails, it depends on the goodwill and probably coincidence whether natural ecosystems will survive. But if these considerations are taken into account, a firm basis is set to work on further. More steps are needed, to be sure in the end to meet goals of sustainable preservations of natural areas, like a chain that should not have one single weak link to prevent it from breaking. Integration of land development and preservation of natural ecosystems is possible, and it takes an integrated effort and multi-disciplinal analysis and reasoning. It is necessary to define the conditions at which natural areas can survive in a self-supportive way. The latter seems essential as far as sustainability is concerned. As soon as land and water development in the neighbouring or upstream region violate these conditions, of hydrological and/or chemical origin, by a certain defined degree, adaptation of the development process in favor of the goal set to maintain the natural areas is to be worked out. As an

alternative, mitigation measures can be taken which should decrease the violation of the conditions effectively, significantly, and above all enough to meet the conditions needed. The basis to discuss and eventually accept adaptation and mitigation measures is the will to stand up for the need of preservation of natural areas, ultimately by stopping or decreasing land and water resources development.

To possibly finance the adaptation and/or mitigation measures, payments for environmental services (PES) or for watershed services (PWS) on different levels of government, from international to local, are one way to generate funding. Test cases and projects are needed still to find out the mechanism and effectiveness. Integrated catchment management, also in a financial way, can play an important role in regulating the services mentioned.

Resulting Question 2: How to enforce international and national laws to protect and preserve natural ecosystems?

In case policy, law, and institutions are set to sufficiently serve the ongoing existence of sustainable natural areas, law enforcement is essential to make it all work. The political will to enforce laws is necessary, because it is more easy to write down laws than to summon and fine people and organisations that work and act against laws. The government institution is to act clear and firm and has to show where it stands for, in this case to protect natural areas from disfunctioning and disappearance.

First of all it is essential that the information about the law(s) and its enforcement is available to and well-known by all parties involved, often including the public. Secondly, regular deliberations with all parties concerned and related to the issue of the protection of and of threat to natural areas will help to discuss and clarify the targets and means by the governmental institutions involved. Last, field visits are needed in such a frequency that there is a reasonable chance to detect or track down offenders. Legal punishment and fines need to be such that repetition is discouraged and the number of violations of law will significantly decrease.

Resulting Question 3: How to create broad public awareness and acceptance of the values and benefits of natural ecosystems?

Policies, laws, and institutions to enhance and achieve sustainable, self-supportive natural areas are on part of the chain that is needed to succeed. Law enforcement on the illegal exploitation of water resources and on water pollution is done far more easily in case the public awareness and acceptance of the values and benefits of natural areas is largely present and wide-spread, especially in those regions where natural areas are present. In case the local and regional public is of the opinion that it is worthwhile to keep the natural areas alive and sound, preservation is relatively the most easy and deterioration the less likely. To create public awareness and acceptance, information, non-financial/non-economic gains (what's in it for me), and financial impulses like charges, subsidies, and financial contributions are helpful. Here, both individual or group-wise and public interest need to be taken care of.

One needs to be aware of the effect of water withdrawal and drainage on one hand and water pollution on the other, and stewardship is needed. Water is a finite source, and in downstream regions clean and sound water is needed as well and/or even more wanted and useful. Information on the subject, including discussions and

	deliberations with downstream users and/or land owners are probably effective in just knowing who or which region needs water for what purpose. Also deliberations between rural and urban representatives may help to increase the awareness mentioned above. Examples of non-financial/non-economic gains are e.g. taking part in decision making and planning as a means to channel the influence and voice of stakeholders in decisions and policies in a transparent and democratic way. In this way also, regional to local traditional knowledge can be used to improve the quality of decisions made, in planning as well as in developments. Also recreational aspects and tourism, human health, education, and diversity in landscape and biological habitats can benefit awareness and acceptance by the public. At last, also the role and function of natural ecosystems in potentially or actually providing sound and clean water for downstream areas by filtration and/or purification is of great value. Financial instruments like taxes, charges, subsidies, and financial contributions can bring together sellers and buyers of environmental services. These finances may origin from international or national sources of funding, maybe even regional. International funding should accompany international declarations of natural ecosystems being worthwhile saving on an international scale. On the national or regional level, taxes on water (intake and discharge) and on land use may provide financial means to support acceptance of natural areas present in a region. In case of water chemistry, taxes and charges should be based on 'the polluter pays' principle. These taxes are functional in order to gain financial means for subsidy or contribution purposes related to natural ecosystems. Rights to use water resources and/or to discharge pollutants need in this way be coupled 1:1 with a taxing system, operated by a legal and trustworthy institution or government level.
(Types of) Organizations to be involved in topic consultations	National: Governments at all levels, land owners, water boards/water management districts, land use planners, water suppliers International: IUCN, UNEP, ICID
Process of paper and session development:	1. Draft 1 of topic scoping paper to be sent to key institutions for comments 2. Improved draft to be placed on website 3. Improved draft with comments received to be discussed at the February coordinators meeting to: a. Agree on key questions b. Agree on the topic document so that it can be placed on the Forum web-site c. Agree on key stakeholders to take part in the development of the topic d. Agree on consultation process: relevant meetings with key stakeholders e. Agree on the process and actors to develop the forum session.

For Reference:

Main question	How can we sustain natural ecosystems under continuous hydrological and chemical pressures from outside caused by land development, water contamination and increasing scarcity of water resources?
<u>Statement 1</u>	
<u>Statement 2</u>	
<u>Statement 3</u>	
<u>Statement 4</u>	
(Types of) Organizations to be involved in session consultations	
Process of session development	

Question 1	How to integrate and combine land development with ecologically sound and self-supporting natural ecosystems?
<u>Statement 1</u>	
<u>Statement 2</u>	
<u>Statement 3</u>	
<u>Statement 4</u>	
(Types of) Organizations to be involved in session consultations	
Process of session development	

Question 2	How to enforce international and national laws to protect and preserve natural ecosystems?
<u>Statement 1</u>	
<u>Statement 2</u>	
<u>Statement 3</u>	
<u>Statement 4</u>	
(Types of) Organizations to be involved in session consultations	
Process of session development	

Question 3	How to create broad public awareness and acceptance of the values and benefits of natural ecosystems?
<u>Statement 1</u>	
<u>Statement 2</u>	
<u>Statement 3</u>	
<u>Statement 4</u>	
(Types of) Organizations to be involved in session consultations	
Process of session development	