

ANNEXES TO THE REPORT

of the

AFRICAN PRE-CONFERENCE

“WATER FOR FOOD AND ECOSYSTEMS: MAKE IT HAPPEN!”

ANNEX C-2: Introduction to the Themes

Theme 2

A “New Economy” of water for food and ecosystems

Annex C. Introductions to the themes

THEME 2: A ‘NEW ECONOMY’ OF WATER FOR FOOD AND ECOSYSTEMS

Making Well-Informed, Transparent and Fair Choices Based on Appropriate Methodologies for Assessing Multi-Dimensional Water Values

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INTRODUCTION

Despite some impressive progress over the past 30 years, protecting the natural environment and ensuring food security are still one of today's top global issues. Positive and negative effects of decisions on water for various competing uses are usually expressed in terms of economic costs and benefits even though much needs to be done. For instance, valuations of natural resources, such as aquatic ecosystems are not considered even though they may be extremely valuable.

Economic valuation is now an influential instrument in environmental decision-making and offers a wide range of new opportunities for improving the productive use and equitable allocation of water for various competing uses. This paper is therefore concerned with improving water valuation for food and ecosystems in Africa. It discusses the various valuation methodologies and the challenges that face valuation of water for practical purposes and makes suggestions towards a ‘new economy’ of water for food and ecosystems. The new economy that would enable stakeholders make well informed, transparent decisions on the allocation of water resources, and ensure that their decisions are consistent with national and trans boundary priorities.

The Concept of ‘Value’

The concept of "Value", particular as it pertains to water, is still debatable depending on the two attributes of water as an economic good and for its social value. However, ‘value’ in any sense of the word, has meaning simply in relation to scarcity. Uniqueness, rarity, replaceability, usefulness, abundance are all related to it (Borgoyary, 2002; Thomas, 2001).

Levels of Value

In economics, two levels of value are recognized: ‘market’ values and ‘non-market’ values, which should be differentiated for practical reasons (Moss et al., 2003).

Market values are generally revealed in exchanges of goods and services. People’s values can be observed to some extent in their market behaviour. For instance, the willingness to pay a great amount for something indicates that it is valuable. It is important not to confuse market value with ‘price’. Price represents the marginal value – the value at which the last (or next) exchange occurs. In contrast, market value refers to the total value of goods and services (Moss et al., 2003). Market value relates more to value in-use while price is associated with value-in-exchange. For example, although the price of water is relatively low it has an enormous value-in-use to humans since it is a necessity to survive, while diamonds for instance have a higher price or higher value in-exchange.

Non-market values are the kind that economists refer to as preferences (or tastes). Non-market values are “deep” or intrinsic preferences such as family values, the value of freedom, the value of relationships, and cultural values. Such non-market values could be expressed, but not perfectly, in market transactions (Moss et al., 2003). The anxiety and debate surrounding the value of water is to

some extent due to this deeper level of values, and to the extent that people are anxious of losing such non-market values if water systems are managed through market approaches.

Value Differences

The value of water differs from use to use, user to user, and place to place. It has been established that market value is not the same as price and non-market values are not represented perfectly in markets. It therefore stands to reason that though markets might be used to allocate and bring the price at which water is exchanged closer among different uses, users, and places people will always have value differences to some extent (Moss et al., 2003).

An instance of a value difference is between advocates of more water markets and those concerned with possible inequalities from using market mechanisms to allocate water. The former tend to regard value efficiency more highly than equity and therefore support the development of water markets as a way of promoting economic efficiency. The latter, on the other hand, value equity more and therefore tend to be against the extension of water markets; which some people value highly. They are not a good means for making equity decisions. However, such positions are not absolute but tendencies that arise from an underlying, important value difference. It is important to bridge value differences between important stakeholder groups in some way if sustainable water management solutions are to be found.

MULTI-DIMENSIONAL WATER VALUES

Value Perspectives

The traditional categories of environmental, social, and economic are the most commonly held value perspectives about water systems. There are many subcategories within these three and many other valid categorisation schemes that have been identified as well. Examples are gender value, public health value and political value of low-priced water services (Moss et al., 2003).

Environmental value: This relates to healthy aquatic ecosystems and the fisheries, tourism, recreation, survival of all species, etc. that depend on them. Water obviously has value even when left in the environment. These "in-situ" values have been relatively neglected in economic analyses. This has been changing since the last decade. Heal (2000), noted that an important and emerging perspective on the value of water is the one that focuses on the value of in-situ water as an essential input for the production of so-called "ecosystem services."

Social values: These include sub-categories such as the value of universal water supply service (100% coverage) or subsidised water supplies for the poor. These issues are also clearly related to the concept of human right to water. Deeply held non-market values are involved here: the value of caring for the poor, the value of human dignity, and the value of social solidarity across income divisions.

Economic value: Relates to operational and allocation efficiency. This brings in the last of the four Dublin Principles that “water has an economic value in all its competing uses and should be recognised as an economic good” (Rogers et. al, 1998). This implies that decisions on the optimum use of water and the allocation to different potential uses should be taken on the basis of socioeconomic trade-off analysis that is independent of the ability to pay. To treat water as an economic good (valuation), therefore, does not necessarily lower its social or ecological importance, but rather complements the social and environmental perspectives.

The need to balance various value perspectives in valuing water is buttressed by the Ministerial Declaration of the second World Water Summit at The Hague (2002) that:
‘Valuing water is to manage water in a way that reflects its economic, social, environmental and cultural values for its uses, and to move towards pricing water services to reflect the cost of their provision. This approach should take account of the need for equity and the basic needs of the poor and vulnerable.’

Practical Valuation Techniques in Africa

A variety of valuation techniques are used to quantify the above concepts of value for water. There are two broad approaches to valuation on water: the direct valuation and indirect valuation approaches. The direct approach uses methods that attempt to elicit preferences directly with the use of survey and experimental techniques such as the contingent valuation and contingent ranking techniques (Borgoyary, 2002). The Contingent Valuation Method (CVM), a technique that is used by asking people how much they are willing to pay for a resource, is applied extensively in Africa. Examples are in Kenya (the Ukundu study) and Ghana (Kumasi improved sanitation study). Despite CVM's shortcomings, including problems of designing, implementing and interpreting questionnaires, the results of the various applications within the continent and other developing countries suggest that it is possible to do a contingent valuation survey among the poor, illiterate population and obtain reasonable and consistent answers – a way of integrating the values of the poor and marginalized in the decision-making process. CVM has also proved to be an appropriate technique that could be applied to common property resources and amenity resources with ecological or other characteristics and for estimating the value of water for agriculture, municipalities, industries and ecosystems (Munasinghe, 1996; Borgoyary, 2002).

In the indirect technique approach, values are based on actual, observed market-based information. Different indirect methods are used to measure the value of water on a sector basis. For instance, crop-water production function analyses and farm crop budget analyses are used for measuring the value of irrigated water. In the former, application of all other inputs in agriculture are assumed to be constant, and the marginal value of each volume of water used is the marginal price times the price of the crop. This method is based on the assumption that the application of different amounts of water incurs the same labour, fertilizer, and the other input costs. In the farm crop budget analyses, the total crop revenue less the non-water input costs is considered to be the maximum amount the farmer could pay for water and still cover costs of production. It thus reflects the on-site value of water.

It must be stated that apart from valuing water for water supply (municipal), industrial and to some extent agricultural sectors several other countries are yet to initiate or are in the initial stages of valuing water for ecosystems. The question is why and what are some of the special problems or challenges?

Challenges to Practical Application of Water Valuation

The key challenges and issues that need to be resolved in the empirical valuation of water for food and ecosystems may be considered under the headings of physical, economic and institutional influences (Thomas, 2001).

Physical influences

Unlike many resources, e.g. labour or a piece of steel, the use of water for one purpose does not necessarily preclude its use for another. In valuing water of a particular quantity and quality at a given time and location, we need to know whether the proposed use is *competitive, complementary or independent* of another (Thomas, 2001).

For competitive uses, allocation decisions require us to impute a value in terms of storage/flow requirements, whereas for complementary or independent uses, say for example fishing, the quantity of water used is not an appropriate measure.

For withdrawal uses, e.g. irrigation for food production, the water consumed on site may be of relevance for valuing the water to the farmer, but from the point of view of society as a whole the volume diverted at source is the relevant quantity. Treatment of return flows is also relevant and should be taken into account. For example, a part of the water diverted for irrigation may increase the returns to the river/canal downstream for the benefit of the ecosystem. Valuation of such a benefit poses a challenge.

Furthermore, the physical productivity of water varies spatially. For example, soils and climate are well-known influences on cropping potential. But there are other perhaps less-appreciated influences. The vertical drop available at particular sites may make the water more or less valuable for some ecosystems.

The implication of the above is that, for a significant water allocation decision there are peculiar difficulties in assigning sound value estimates that would reflect real value associated with water use and/or non-use.

Economic influences

The circumstances of users have to be considered in valuation since it influences their willingness to pay for water. The period of analysis used in valuation then becomes important. Using a year as the time interval may mask rather than highlight competitive and complementary relationships. Water demand for crop irrigation is a seasonal activity. As a result demand is correlated with supply, rather than being independent of it.

Institutional and Decision Making Influences

Institutions for water allocation are established to overcome conflict, uncertainty and social anarchy. In some Africa countries these are yet to be established. In most jurisdictions, systems of water rights and obligations are also yet to grow up.

The next issue is how can various stakeholders especially those without a strong voice such as the rural poor and the environment itself express their water value in the decision making process? This is done through value signals such as price mechanisms, people's statements about what they value through their involvement in the application of valuation techniques, political actions, and other behaviour that allows them to communicate value signals. However, more work needs to be done to understand how people communicate their value priorities to decision-makers.

Furthermore, can consensus be built across such vastly different value perspectives? It can only be achieved when people with differing perspectives agree to governance processes under which their perspectives can co-exist.

Environmental Influences

There are real challenges in understanding the environmental value of water resources. To make rational decisions on the environment, should we attach money values to natural resources? What problems arise from this approach and are there practical ways round the drawbacks?

For example, a healthy environment is clearly valuable to people via direct and indirect uses, and options for future use. But some people believe that nature has value apart from its usefulness to humans. This is a non-market value held by "deep ecologists" and other groups. Such groups often oppose market or conventional economic approaches to estimating the environmental value of water resources.

Another difficulty is that we often can't quantify very accurately the full chain of consequences of actions that degrade or restore ecosystems. Without this knowledge, how can we quantify the benefits or costs of such actions? Work in this area must be encouraged.

Challenges in Allocation of Water

Generally, allocation of water is carried out through markets, other means (*e.g.*, state-controlled, quotas, and bureaucratic allocations), or combinations of market and non-market processes.

Unfortunately, the allocation of water resources is an important and increasing challenge for most developing countries. The particular challenge is to decide how much water, and of what quality, should be reserved for the maintenance of ecosystems through an "environmental flow allocation", so as to maintain the provision of their range of valuable natural goods and services, and how much water can be allocated for food production, industry, and domestic services.

SHIFTING PARADIGM: TOWARDS A NEW ECONOMY OF WATER FOR FOOD AND ECOSYSTEMS

In trying to address the issues raised and discussed above the focus is on the possibility of a new economy for water for food and ecosystems.

A new economy basically refers to the valuation of water with the view to improving the economic productivity and distributional equity of these (food production and ecosystems) and other water uses. Decisions that are made should be consistent with national and transboundary priorities, most of which are well defined. To achieve this new economy the following issues are highlighted and recommendations made.

Account should be taken of different aspects of ecosystem services that are currently not accounted for or underestimated

It has already been noted that economic valuation is now an influential instrument in water for food production and environmental decision-making. Unfortunately, some or most aspects of ecosystem services are not accounted for or underestimated. In addressing this issue a wide range of new opportunities should be explored that:

- go beyond a purely scientific assessment and reflect preferences of people
- make environmental policy more rational and transparent
- reveal the hidden environmental costs and benefits of policy decisions
- include the value of natural resources in national accounting systems.

The need to identify methodologies and approaches to valuation that would work well in practice for different agro-ecosystems

Experience with economic valuation techniques in environmental decision-making points to two key lessons:

- Each valuation methodology and approach has its own limitations
- given their limitations, selected valuation methodologies need to be systematically combined with - or set against - other forms of assessment to achieve best results.

The ongoing debate leads to more fundamental questions about uncertainties arising from sources of environmental data.

Stakeholders need to be supported to express and voice their values (guaranteeing environmental base flows to meet ecosystem needs, water as a human right, and ensuring food security for all

People have developed various strategies for working out their differences productively. Three strategies are mentioned (Moss et al, 2003):

Formal Political Processes: are one way of reaching compromises and trade-offs between different value perspectives. They are essential when a decision outcome is needed that may impinge on the interests of certain parties against their will. This is why political processes are usually formalised: they often create "winners" and "losers." Consequently, political processes benefit when other processes that don't have this limitation are used to supplement and inform them.

Market Processes: are another way of reaching compromises and trade-offs between different value perspectives. People express their values in buying and selling decisions and obtain information about the values of other market participants. Markets with poor quality information or asymmetries in

information may lead to poor pricing decisions or may prevent such decisions from being made at all. With most developing countries exhibiting such characteristics, market processes are quite uncommon and currently not ideal for most African countries.

Consensus Processes: are historically forms of governance that have existed and been very effective ways of organising the functioning of common interest activities in communities. A modern form of this is the multi-stakeholder dialogue that potentially leads to consensus. These are a third avenue through which people can and do express their values and try to work out conflicts between them (i.e. prioritise and reconcile their values). Such dialogues tend to be relatively informal and time consuming. But they usually have the advantage of being inclusive and driven from the bottom up and less driven by wealth or power considerations. They are also well adapted to situations like water governance that requires regular review and adjustment.

Stakeholder dialogue is an important but neglected adjunct to market and political decision-making processes. The processes need to be more widely developed and integrated better with the other processes so that the strengths of markets, political and dialogue process can operate in a complementary manner. An example is the case in Ghana where ensuring water as a human right, cassava for starch production for maximum financial value in the short term and the long term healthy aquatic ecosystems and a sustainable level of agricultural production were in conflict.

Through a consultative process consensus was achieved. Three lessons from this experience were that:

- A relatively informal stakeholder process helped to solve a problem that was not solvable using formal political processes, alone.
- Consultation of stakeholders was necessary but not sufficient. A legitimate authority was needed to guarantee enforcement of the rules accepted by the representatives of conflicting interests.
- Scientific analysis and models are very useful to explain the issues, bring more objectivity to the discussions, and describe scenarios. However crises require fast action and it is not possible to wait for “perfect” simulation tools.

Identify the current gaps in the valuation process and address them

The identification of current gaps in the valuation process can be fostered through applied and practical research on value measurement. In doing so, it is important to note that a substantial body of literature on the value of ecosystems, for example, already exists but invariably much of it is academic and difficult for the ordinary man to understand and interpret.

Efforts should therefore be made to make such critical literature much more practical calling for promoting research on the value of information sharing and exchange.

Water valuation principles need to be translated into allocation decisions and policy instruments

Economic valuation of water for agro-ecosystems can and should feed into the policy-making process. In this direction, a distinction should be made between decisions on ecosystems and decisions in other policy areas such as food production. Furthermore, a distinction may be made between levels of policy (e.g. regulation and projects).

Valuation is relevant at each level of decision making (basin, national, etc), but may be used more extensively at one level than another. At the regulations level, there could be a need for complete and comprehensive assessment of allocation benefits as well as more cursory analyses.

CONCLUSION

The principle of valuation of water cannot be ignored in our quest to attain productive use and equitable allocation of water. However, quite a number of issues and challenges need to be overcome, especially in Africa where the adoption and implementation of valuation of water for agro-ecosystems in particular are in their infantile stage.

There is however no gainsaying the fact that given the efforts that are currently being put in, a new economy where water valuation principles would be adequately translated into allocation decisions and policy instruments and ensure that productive use of water for agro-ecosystems.

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