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GLOBAL REVIEW OF ECONOMIC INSTRUMENTS FOR WATER MANAGEMENT IN LATIN AMERICA

EXECUTIVE SUMMARY

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Executive Summary

This is a summary of a report prepared for the Regional Policy Dialogue of Latin American countries on 25th and 26th February 2003 in Washington D.C. The report contains an overview of the available international literature and information on the application of economic instruments in water management, with particular emphasis on the European experience. It presents a typology of economic instruments along the water cycle and discusses their applicability to the Latin American context.

1.1 The Case for Economic Instruments

1. Scientists and policy makers alike have increasingly acknowledged the benefits derived from instrumentalizing market forces towards supporting the achievement of environmental objectives. Economic instruments (EI) have gained particular attention in recent years as an important tool in environmental policy making, as they are capable of integrating environmental concerns in economic decision making processes. Their advantages include the creation of incentives for behavioral change, the generation of revenue for financing further environmental investments, the promotion of technological innovation and additional effects such as the strengthening of institutional capacity and information availability.

2. The European experience with economic instruments is varied and extensive. This report seeks to identify economic instruments appropriate for use in Latin American water management context by presenting illustrative cases drawn from European experiences.

1.2 Experience with EI for Water Management in Europe and OECD countries

3. The application of economic instruments in the water sector can basically occur along the entire water cycle as Figure 1 illustrates. The extent to which they are used and the experiences gained differ across countries. While water prices and sewerage charges are common instruments in all European countries, tradable permits find no application at all, thus, one must draw on OECD- experiences. The instruments are presented in Figure 1 below and describe function and intended outcomes as well as provide examples where they have been applied.

Water abstraction taxes

4. Water withdrawal or abstraction taxes are levied on the direct abstraction of water from natural sources. This instrument can be used to address water scarcity problems and to internalize environmental and resource costs into the (economic) decisions of water users. It can combine revenue raising purposes with an incentive function. The calculation of the tax can be either volumetric and based on metered abstraction, or linked to abstraction permits. Tax rates may reflect relative water scarcity and thus be subject to regional or even seasonal variation. They may also vary between ground and surface water as in the Netherlands, where the tax applies to groundwater abstraction only in order to promote the use of surface water.

5. Observed effects of abstraction taxes include a decrease in water consumption and leakage (Denmark) as well as a strengthening of institutional capacity and improvement of data availability (Germany). Furthermore, the tax raises revenue that can either be earmarked for further investments in water management (Germany) or constitute an additional source of finance for the general government budget (Denmark).

Water prices

6. The main function of water prices is to finance water supply infrastructure. Ideally, they may also aim at internalizing external environmental costs and providing an incentive to use water rationally. They are often composed of fixed and volumetric (consumption-dependent) components. Generally, water pricing policies address three distinct sectors, namely households, industry and agriculture.

7. The French water laws include a system based on the polluter-pays principle as well as a framework for water charges used to improve water quality and prevent deterioration. There is thus an attempt to achieve full cost recovery in water services, although there is some debate as to whether or not France achieves this target given the presence of subsidies. In Germany, charges for water services provision are predominantly based on metered water consumption. Excessive water use is discouraged by some companies through the use of progressive charges, that is, by raising the charge rate as volume increases. Public drinking water services are governed by the principle of full cost recovery. Water companies must ensure that water prices cover costs of supply, that customers pay for their consumption levels (user-pays principle), that tariffs are determined by cost structure, that there be a return on capital, and that the real value of assets should be maintained.

Prices and charges in sewerage collection and treatment

8. Sewerage charges are levied on indirect discharges of used water to the sewer and mainly fulfill a financing function. They can be seen as an implementation of the polluter-pays principle if they incorporate sewage treatment costs. The charge is often based on metered water consumption, although there are alternative systems (e.g. in Austria). The European experience illustrates that systems differ in the relative contributions from fixed components and volume-based charges.

9. Sewerage services are a sovereign service in Germany provided by the municipalities. The current trend is a move away from municipal operations included in the general budget toward separate municipal entities which operate on their own clearly defined budgetary allotments. The setting of charges in Germany mostly aims at recovering the costs for operating and maintaining the sewerage system and is guided by four principles:
   - Charges are set in proportion to the services provided (metered consumption);
   - They reflect the benefit a user derives plus the costs incurred in providing the service (charges for new connections are borne by the property owner);
   - Charges should not differentiate between users;
   - They should be set at cost recovery rate.

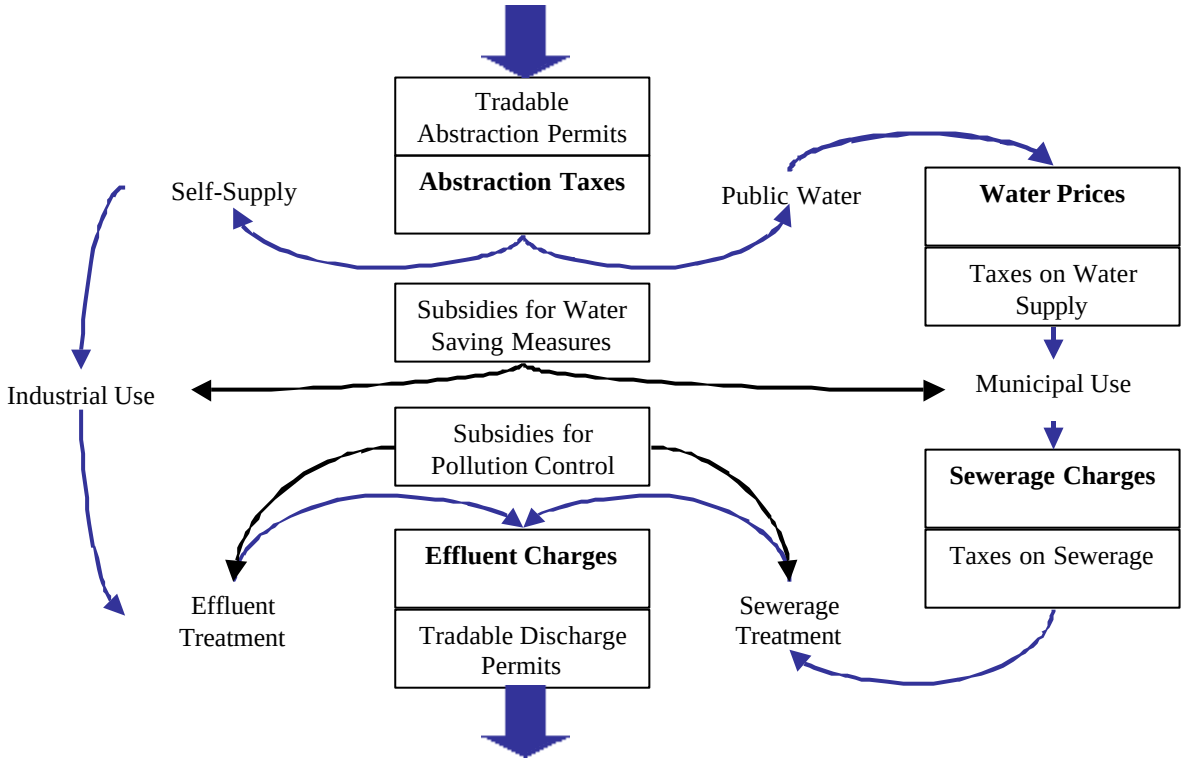
10. In Denmark, the provision of sewerage services is not exclusively carried out by municipal authorities, but a significant part is dealt with privately by property owners or neighborhood community groups. The basic principle guiding the financial arrangement of sewerage services in Denmark is the proposition of economic neutrality or self-sufficiency (Hvile-i-sig-selv) which is equivalent to the cost-recovery principle. The Danish sewerage charge consists of an initial connection charge plus a charge for sewage collection and treatment. Municipalities are free to establish calculation methods for tariffs and charges but must respect the cost-recovery principle.

11. In France, municipalities are responsible for sewerage services but are free to choose between self-provision (direct management) and delegation to private enterprises. In a number of cases, inter-municipal associations have been formed. The municipal authorities are required to apply the principle of cost-recovery and to make no profit. In the French system, there are sewerage charges depending on consumption, non-recurring contributions to the initial investment cost for connection, as well as increased charges for heavy polluters

and reduced charges for entities producing sewage which is particularly inexpensive to treat. Subsidies continue to be quite important in the French system.

12. Comparing household bills for water supply and sewerage services across countries in order to evaluate how the different systems ultimately affect users is a difficult task to accomplish, due to the inherent differences in underlying system parameters.

Figure 1: Economic Instruments for Water Management (adapted from Kraemer 1995)



Prices and charges in industrial effluent disposal

13. Effluent charges are based on the pollution load or on the volume of waste water discharged into natural water bodies. The calculation of the charge rates requires adequate measurement of the quantity and quality of the discharged water. Effluent charges are a means of implementing the polluter-pays principle. Revenues can be earmarked to finance measures to improve water quality or the restoration of polluted water bodies. The charge may be designed to provide incentives for pollution abatement.

14. The systems presented differ in their main objective: the Danish and German effluent charges focus on incentives while the French and Dutch charges emphasize revenue-generating functions. The systems also differ in the calculation methods used and in the substances included in the charge.

15. Denmark and Germany levy charges only on direct discharges, leaving operators of sewage treatment plants to pass the cost of the charges on to their clients, the indirect emitters. France and the Netherlands follow a conceptually different approach by charging indirect emitters directly and either exempting the operators of sewage treatment plants from paying

effluent charges (France) or granting generous reductions (the Netherlands). Either way, the indirect dischargers are brought into the charging system and have to pay their share.

16. In the Netherlands, Germany and France, collected revenues are earmarked for water management activities in a broad sense. In Denmark, revenues generated by the effluent charge constitute a contribution to the general government budget.

Subsidies

17. Subsidies in water management come in a variety of shapes and forms; analyzing subsidy systems thus is a complex task. Subsidies are government interventions that can be direct, through monetary payments to certain user groups, or indirect in the form of tax concessions, discounts or preferential procurement policies. They may introduce distorted signals by favoring environmentally unfriendly choices over environmentally friendly ones. On the other hand, subsidies may also create incentives for users to change their behavior towards environmentally friendly conduct or to induce investment in environmentally friendly production techniques. If subsidies are given in return for environmental benefits, they can be regarded as an internalization of external costs. There is also a distinction between subsidies for measures that are required by the law and subsidies that promote measures which are not mandatory.

18. Many European countries have subsidy programs that are related to environmentally friendly farming for instance, payments made to farmers who are subject to restrictions of fertilizer use in water protection zones (United Kingdom). New Zealand, which removed all agricultural subsidies in 1984, provides an antagonistic case. While the removal was largely undertaken for economic reasons, it was also considered necessary to remove distorting price signals and to address environmental 'bads' before offering governmental assistance to farmers for the provision of environmental 'goods'.

19. Subsidies are also often directly related to water management, such as financial support for the building and upgrading of water plants, and water price discounts.

Tradable permits

20. The creation of transferable rights (tradable permits) for water use and discharge are a possible way to deal with allocation issues. According to economic theory, in a perfect market the trade of water rights will lead to the optimal allocation of water from shared resources.

21. As there is no experience in the EU with tradable water permits, the cases of Australia and Chile are reviewed in this report. Several points emerge that should be considered for the effective initiation and operation of a tradable permit scheme:

- The definition of property rights and a transparent initial allocation mechanism are vital to the success of any trading scheme.
- In most cases, tradable permit schemes need to take into account the regional physical scale for the development of a market, and bear in mind the specific framework of each region.
- Successful trading regimes tend to build on pre-existing institutions and are integrated into traditional regulatory regimes. This often includes the combination of tradable permits with other economic instruments (i.e. taxes, charges), in order to create mixed instruments for more effective water management.
- The success and effectiveness of water trading markets depend on the frequency of trades and the number of market participants.

Environmental liability laws

22. Environmental liability laws can fulfill a reinforcing complementary function, even though they are not economic instruments per se. Environmental liability laws have the function of internalizing and recovering the costs of environmental damage through legal action. By establishing that polluters have to pay for the damage they cause, environmental liability provides an incentive to control and prevent pollution. In the case of damage occurred, it allows for the compensation of victims. Environmental liability is only applicable where one or few responsible actors can be identified, and is thus not suitable to address diffuse pollution from multiple sources. This report reviews a proposal for an EU directive on environmental liability as well as the national regulations within the Member State Sweden.

Water User Associations

23. The German "Water Association Act" allows for the formation of so-called Water User Associations that fulfill water management functions and form an interface for the different water uses and users. They are self-financing institutions used for the construction and financing of water infrastructure. A water association can be established by the unanimous decision of all interested parties and subsequent approval by the supervisory authority, or by majority decision of interested parties and approval including the enforced participation of additional members.

24. Water user associations are a decentralised form of water management that have successfully incorporated full-cost recovery principles into its operations, primarily achieved through pricing instruments.

The European Water Framework Directive

25. The European Water Framework Directive (WFD) is one of the first environmental policy Directives of the European Community that explicitly draws on economic instruments for achieving its objectives. Economic approaches are integrated into the Directive, including the polluter-pays and the cost-recovery principles. The EU Member States, Norway and the European Commission agreed on a common strategy approach for the implementation of the WFD. Working groups of experts and stakeholders have been formed that have issued guidance papers for a common implementation of the Directive. The implementation process of the WFD exemplifies the promotion of public participation, increased transparency and more extensive and reliable reporting.

1.3 Experience with EI for Water Management in Latin American Countries

26. As the report outlines with the help of case studies, experience with economic instruments in water management already exists in Latin American countries. To name a few examples:

- Effluent charges have been in place in Mexico and Colombia since 1991 and 1974, respectively, and are under discussion in Jamaica and Brazil;
- Credit and tax incentives are offered for environment-related investments e.g. in Brazil, Mexico and Colombia to cover abatement investments or clean technology adoption in the industrial sector;
- In two Brazilian states, Sao Paulo and Rio de Janeiro, sewage tariffs are levied by sanitation companies on industrial users. In the greater Sao Paulo Region, considerable revenue has been raised through the charge, although only partial coverage has been achieved because of monitoring difficulties;

- Chile has extensive experience with tradable water permits. Chile has a long tradition in water property rights, which is believed to be the basis for the political acceptance and enforceability of the system.

27. Several challenges exist that may act as an impediment to the introduction of economic instruments in Latin America:
    - Deficiencies in the administrative and institutional settings
    - Lack of effective monitoring and enforcement procedures
    - Unclear lines of responsibility and accountability hindering the implementation of sophisticated charging systems
    - The lack of integrated river basin management
    - Weak inter-linkage, both on an inter-sectoral as well as between federal and regional levels
    - Insufficient stakeholder participation
    - Lack of adequate staffing
    - Budgetary problems due to the capital intensity of the required infrastructural and operational investments
    - Lack of adequate and reliable hydrological, meteorological and water quality data
28. The analysis singles out some relevant factors that are necessary prerequisites or useful tools for the successful implementation of economic instruments:
    - Capacity building
    - Decentralization
    - Spatial Organization
    - Integration
    - Participation
    - Earmarking of revenues
    - Public education programs
    - Transparency
    - Autonomy of decision making

1.4 Lessons Learned – Conclusions and Recommendations

29. While European approaches may not be applicable to all cases and may need to be modified to meet the specific circumstances in Latin-American countries, there are, nevertheless, lessons to be learned. A non-exhaustive list of issues will be presented below that can hopefully provide guidance on that matter.

30. There is a growing consensus that integrated water resources management is crucial in solving Latin America's water-related problems. Integrated management is a prerequisite for a successful implementation of environmental taxes, as the design of an equitable and fair system (for example of supply charges or abstraction taxes) requires that all uses be taken into account. European experience, such as the implementation process of the Water Framework Directive (WFD), can serve as an instructive example for a reorganization of procedural and organizational issues aiming for integrated management of water resources. Observing how the EU Member States proceed in order to fulfil the demands of the WFD can also be instructive. Furthermore, the implementation process of the WFD exemplifies the promotion of public participation, increased transparency and good reporting practices.

31. Based on the Latin-American case studies, earmarking of revenues is recognized as an important factor for the successful implementation of economic instruments. The European experience reinforces this conclusion: Many European countries use earmarking of revenues, and it is assumed that the resistance to a charge is smaller if the responsible authorities retain control of funds collected and use them for environmental programming or investments in the water sector. The more transparent the use of revenues collected is, the easier it is to raise public support for a new scheme.
32. While the EU experience in water pricing and with regard to subsidies is certainly relevant on a technical and organizational basis, differences in social settings must be considered. The social challenges faced in the water sector of less developed Latin-American regions require water pricing policies to be carefully blended with complementary cross-subsidization or compensation schemes.
33. Sewerage charges are common in all European Member States. While the same cautions apply here as to water pricing, increasing the coverage of households connected to the sewerage system could be supported by carefully designed charging schemes that aim at recovering the costs. Charges would provide operators and administrations with the necessary funds for the required investments. Increasing the access of poorer population groups to the sewer system is further desirable from the point of view of health of the population.
34. Integrated river basin management should be promoted in areas with high intensity water use. The examples of river basin organizations for instance in the mining areas in Europe, can serve as instructive cases (for example the Water User Associations in Germany).
35. The European experience may be drawn on particularly with respect to economic instruments that so far have not or only in few cases been applied within Latin America (for example abstraction taxes, pollution taxes).
36. Facilitating and strengthening the cooperation between European and Latin-American actors and intensifying the exchange of experience and ideas would offer an opportunity for more direct case-specific support and advice by relevant actors in the field.
37. Considerable gains from cooperation can be expected through furthering the flow of information among regulators and officials on economic, environmental and health issues.
38. Steps should be taken to promote capital investment and to encourage different forms of private sector involvement to help build capacities. Private European enterprises can fulfill an advisory function, thereby importing their expertise in the field.

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