

OECD EXPERT MEETING ON “SUSTAINABLE FINANCING FOR AFFORDABLE WATER SERVICES: FROM THEORY TO PRACTICE”.

PARIS, 14-15 NOVEMBER, 2007.

REPORT

The Expert Meeting attracted around 50 participants, drawn from delegates of Member States, officials from international organisations, academics, consultants, and staff from various OECD Directorates. The Meeting was divided into four main sessions:

- i) an overview of the OECD’s Horizontal Water Project;
- ii) water pricing: from theory to practice;
- iii) agriculture water pricing and policies
- iv) innovative business models to finance water services.

I. Overview of OECD’s Horizontal Water Project

This first session was chaired and opened by **Helen Mountford** (Head, Climate Change, Natural Resources & Environmental Outlooks Division in OECD’s Environment Directorate), who explained that the Meeting was an opportunity for OECD to present its Horizontal Project to a wider group of interested stakeholders, and was inviting guidance from participants on its present and future work plans.

Monica Scatasta (OECD Water Project Co-ordinator, CNRO Division, OECD Environment Directorate) introduced the Horizontal Project, which consists of 3 Pillars:

1. Water pricing and financing; Within OECD this entails cooperation between ENV, TAD and DCD Directorates;
2. The development of realistic financing strategies for water and sanitation infrastructure. This component fell mainly to ENV Directorate;
3. Application to the water sector of the 2007 OECD Principles for Private Sector Participation in Infrastructure. This was the prime responsibility of DAF.

There are a number of reasons for undertaking the Project. It is essential to ensure sustainable financing for the operation, maintenance and expansion of the infrastructure necessary to achieve the global aim of water and sanitation for all. Tariffs are a crucial element of this, but they have to satisfy a number of objectives, which were difficult to reconcile and there are particularly difficult challenges in agriculture. Additional sources of finance will be necessary, including commercial sources and private equity. All these sources need to be factored into realistic and adequate national water financing strategies.

Monica then introduced the activities under Pillar 1. Tariffs are the cornerstone of any financing strategy, but the workings of these and other economic instruments need to be better understood and designed for them to be “fit for purpose”. Water pricing needs to be analysed both as a tool to ensure sustainable water and sanitation service provision, and as an incentive to improve water resources management. The Pillar will explore how new financing parties should be brought to the table, possibly with different rules of engagement than in the past.

Pillar 1 includes an assessment of water infrastructure needs in the OECD and BRIC¹ countries, an updated survey of water pricing practices in OECD and non-OECD countries, a major focus on the use of economic instruments in the management of water in agriculture mainly in OECD countries, and the study of innovative business and financing models. She also mentioned work in DCD assembling and analysing data on Official Development Assistance to the water sector. The project output will be fed into forthcoming high-level events, namely the 5th World Water Forum, the World Bank and Stockholm Water Weeks, and the OECD’s own High Level Meeting on water financing planned for the autumn of 2008.

Work in Pillar 2 was introduced by **Peter Borkey** (EG Division, OECD ENV). A main aim is to support the governments of developing countries in the preparation of realistic finance strategies for water. A key part of this work is the development of the FEASIBLE financing modelling tool for application in developing countries, piloted initially in two African countries. In parallel with this, the tool would continue to be applied in EECCA² countries. The programme involves close cooperation with the World Bank’s Water and Sanitation Programme - which is using the SWIFT tool for similar purposes - and with the EU’s Water Initiative.

A Task Team, chaired by the AFD³, has been formed to support this work, and specifically to promote the adoption of financing strategies amongst developing countries. In line with a main message of the Gurria Task Force, the work of the group will include overcoming obstacles in the demand for water finance. Projects and pilot studies are planned or underway in Egypt, Burkina Faso, Moldova, Georgia, Armenia and Kyrgyzstan.

Pillar 3 was introduced by **Celine Kauffmann** (DAF). Its main components are: conceptual work in developing guidance for PSP⁴ in water services, building an evidence base from the experience of 30 developing and emerging countries, and promoting the guidance in the target countries. A series of Regional Round Tables is planned, starting with that for Africa in Zambia, and continuing with others in MENA⁵, Asia and Latin America. The focus of the programme is on drinking water and sanitation services, including both financing and management, taking a broad view of “private” to include small-scale operators as well as international investors. Recognising that PSP in this sector has been controversial, the

¹ Brazil, Russia, India, China

² East Europe, Caucasus, Central Asia

³ *Agence Francaise de Developpement*

⁴ Private Sector Participation

⁵ Middle East & North Africa

project will be concerned with such keynote areas as design of incentives, strengthening “ownership” of the process, uptake of innovative financing tools, and building on the diversity of private agents.

To complete the *tour d’horizon* of OECD work, **Valerie Gaveau** (DCD) presented some results of the exercise to collate data on ODA flows to the water sector, summarised in the OECD briefing paper “Measuring aid to the water sector”⁶ The five-year moving average of commitments of ODA from DAC⁷ members is now recovering from its low point in 2001, though there will be a delay before actual disbursements trend upwards.

Commenting on these presentations, **David Lloyd Owen** (Envisager Ltd consultancy) praised OECD’s initiatives and focused on its vital potential role as an information bank. Reliable and systematic international data on water indicators, following consistent definitions, is a vital – and still missing – element in sensible debate (e.g. over how far countries are on target to meet the MDGs⁸). Better, and reliable, data would remove some of the headroom for corruption, highlight best practice and the possibilities of good management, and identify cost-effective practices and technology. Data should be good and consistent enough to be widely used by its target clientele, and freely available for downloading. In pursuit of this “moral purpose” as a data bank, OECD should forge close links with key national, regional and international bodies working in the same area.

On Pillar 1, he suggested that OECD focuses:

- i) not only on pricing data but also on data on the cost of service provision and extension, with detailed breakdown of operating expenditure (OPEX) and capital expenditure (CAPEX) for new assets and renovation,
- ii) assessing the economic costs of not being served,
- iii) tariff structures that ensure both affordability and adequate levels of service.

For Pillar 2, he indicated the need to look at ways to lower the cost of capital and to consider the pros and cons of instruments such as securitization. He stressed that water services can be a profoundly sound investment provided they are managed correctly. On Pillar 3, he stressed that the private sector was neither the problem nor the whole solution – though it is one element in a possible solution. The face of PSP is changing: until recently it was dominated by the Big Five companies, now it is being driven by “second tier”, predominantly regional and local companies. The 1990s paradigm, financing water infrastructure through foreign exchange debt, is being overtaken by new models involving local currency debt and equity.

Jack Moss (Aquafed, representing BIAC⁹ Water Group) affirmed strong business support for the Horizontal Project arguing that “business cannot succeed in societies that thirst”. Companies need water throughout their value chain to enable them to deliver the goods and services that societies demand from them. The business community sees this project as an ideal opportunity to use the OECD’s strength in bridging politics and economics, bringing its strong analytical capacity to bear on this sensitive topic.

⁶ www.oecd.org/dac/stats/crs/water.

⁷ OECD Development Assistance Committee

⁸ Millennium Development Goals (for water and sanitation)

⁹ (OECD’s) Business and Industry Advisory Committee.

Many water services (water and sanitation as well as irrigation and energy) are "structurally bankrupt" because of unsustainable approaches to water economics. In this situation costs exceed revenues, which in turn are perceived to be greater than the "value perception"¹⁰ of the "worth" of the service provided. He suggested that political understanding and commitment to ensuring sustainable economics is essential to arrive at long-term viability of water services. Sustainable cost recovery, including the role of predictable and reliable public subsidies, is a key element. The needs of the poor and deserving should be tackled head-on, and should not be allowed to dictate general pricing policies. Under-funding of the water sector triggers a downward spiral of poor services, an unwillingness to pay more, and a consequent shortage of funds for re-employment in the sector. Turning a vicious circle into a virtuous spiral rests on "value perceptions" – persuading the public, but more importantly politicians, of how valuable and beneficial viable water services are to all communities.

Catherine Revels (World Bank Water and Sanitation Program, East Asia) completed the commentary with an account of the specific issues arising in providing water and sanitation services to Asia's urban poor. The, by now familiar, problems of extending services to Asia's urban and rural populations – including the indication that the problem is often politicians' unwillingness to charge rather than users' unwillingness to pay– were illustrated through the contrasting experiences of three projects. The Tirapur water project in India is a Private Sector Participation project which is proving to be unsustainable, relying as it does on heavy cross-subsidy from industrial to household consumers. Industrial demand from the public network is falling due to below-cost sales by informal suppliers, who exploit the margin between village water sellers and industrial users on the increasing block tariff (IBT) structure. The demand for water has also been affected by greater recycling and reuse forced by tighter pollution standards.

In contrast, the Mumbai Slum Sanitation Project consists of the provision of community toilet blocks, relying on community mobilisation and local participation in financing and management. Users contribute to the capital cost and the recovery of operation and maintenance costs through memberships and user fees. This project is being replicated elsewhere and has been incorporated into national policy. Community involvement and mobilisation is also the keynote of the Bangladesh Productive Use of Water project, providing arsenic-free water to communities, paid for largely from the proceeds of "productive" water use. This project promises well, though the charges meant to recover capital costs have not so far been levied, which may put the project's sustainability at risk. The main lessons from this, and other successful projects, are the need to (i) take the time necessary for intensive participatory involvement of the target communities, (ii) secure financing for project preparation, (iii) consider systemic sustainability, (iv) design financing to mitigate risk, (iv) get the pricing right, and (vi) ensure professional service delivery.

Amongst the points arising in **open discussion** were:

- OECD should carry out full stakeholder consultation on this sensitive topic and to "contextualise" its analysis and policy recommendations, since water is a local issue
- There was support for a greater OECD role in collecting water data and monitoring relevant trends (referred to as a water "Observatory"). This should be linked with an analysis of the institutional setting of water service delivery and water management
- Other deserving topics for OECD research were affordability issues, cross-subsidization, and an analysis of where subsidies are going (targeting). Work on ODA should include not only their volume, but also their outputs and, ideally, their outcomes

¹⁰ See Moss, Wolff, Gladden & Gutierrez "Valuing Water for Better Governance" 2003

- The capacity of the labour force in the water sector should be enhanced, as efficiency in service provision often depends on the quality of utility staff and cooperation within the provider's structure
- Water, like food, is both a human right and a commodity, though it is not a commodity like others. Water is in fact many different commodities – water pricing should not be categorised along user lines, but instead according to the type of water service that is being provided (e.g. treated vs. untreated)
- The human right to water should be reformulated as the right to a minimum amount of affordable water. Sanitation should be included in this principle, but is yet to be defined properly.
- It is important to emphasise the “value perception” of water. In certain countries there is public pressure to lower water prices because there is no perceived crisis. Utilities should engage in public participation and communication with customers on the cost of providing services in relation to the value of water.
- Subsidies may be justified by the external benefits and the social and poverty objectives of better water and sanitation services. If so, they should be transparent, well targeted and sustainably financed.
- Discussions of PSP should take into account that public sector investment is often embedded in private investment. Failed PSP cases also have a cost – it is important that both good practices and failures should be considered.
- On a point of information, The Delegate from Spain announced that Zaragoza will host World Expo 2008 on the topic, Water and Sustainable Development.

II. Water pricing: from theory to practice

This session was chaired by **Helen Mountford** (OECD ENV). Introducing the topic, **Monica Scatista** (OECD ENV) pointed out that, although water pricing is central to the sustainable financing of the sector, but its implementation still attracts controversy over issues such as multiple objectives, the role of tariffs in addressing water scarcity, the specific challenges of sanitation, the interpretation of full cost recovery, and the implementation of pricing in developing countries. She described some key tasks of the programme, notably updating the earlier OECD work on water tariff levels and structure in different countries, and deeper analysis of knotty problems such as those mentioned above.

Prof John Boland (Johns Hopkins University) gave a concise exposition of some of the economic theory of water tariffs – objectives, constraints, and criteria, pointing out some of the conflicts that arise from the application of the marginal cost principle (e.g. between economic efficiency and full cost recovery, and the problem of affordability). He argued that many tariffs are not properly designed, and most include the common expedient of increasing block tariffs (IBTs), which provide a regressive and possibly ineffective subsidy, unrelated to need. He proposed the use of a single rate volumetric tariff, with a rebate targeted to customers in special need.

He stressed that affordability was a household, not a community, problem, which implies that there is no reason why fiscal sustainability and affordability should clash if tariffs are designed properly. He believed that a well-designed tariff can be designed to meet the multiple objectives of economic efficiency, fiscal sustainability, resource conservation, equity¹¹ and fairness. He proposed that designing the “best

¹¹ Defined as the principle that “equals should be treated equally”.

compromise tariff” should start from the most restrictive objective (economic efficiency, i.e. setting a marginal cost covering tariff), proceed to the relaxation of some constraints to meet the next most restrictive objective with the least damage to the first, and so on. Revenue sufficiency, being the least restrictive objective, should not be sacrificed. He suggested that a uniform tariff, with (targeted) rebates to deal with affordability issues, could be a good choice.

Anne Olivier (*Ecole des Hautes Etudes en Sciences Sociales*) followed with a presentation on the principles and practice of affordability. In the developing world the urban poor have limited access to the water network, and the widespread underpricing of water deprives water authorities of the resources to expand their network. In one survey she cited no cities in SE Asia and the Maghreb region recovered O&M¹² costs, and only 61% in the whole sample of cities did so. However, raising prices to full cost recovery levels would raise tariffs to the point where monthly water bills would rise to more than 5% of household incomes in most parts of Asia and Africa.

IBTs have been widely adopted as a means of cross-subsidy. In practice, they are often poorly designed, with too large an initial subsidised block and insufficient users in the higher blocks necessary to furnish the cross-subsidy. Another crucial problem is that in many cities low income users have large families and share metered connections with others, thus pushing them into the higher tariff blocks. Consumers in the higher tariff blocks are likely to reduce their usage (i.e. their demand schedules have higher price elasticities), which would also affect the surplus available for cross-subsidy. This further strengthens the case for adopting uniform tariffs with targeted subsidies. However, targeting households according to need may be administratively costly, in which case subsidies could be concentrated on users having the lowest levels of service (either by choice or *de facto*).

These issues were illustrated with reference to Casablanca (Morocco) and Manaus (Brazil), where the extension of metering and reducing the subsistence threshold may have reduced the regressive nature of IBTs. Another key issue from these cases is the affordability of connection charges, and whether to subsidise connections as opposed to the amount consumed. It may be preferable to target households based on users’ self-selection by choice of service levels, so as to reduce the unit costs of increasing access. However, some city dwellers may resist the suggestion that they should settle for lower levels of service, which could be perceived as inequitable.

Joao Simao Pires (Institute for the Regulation of Water and Solid Waste, Portugal) described the functions entailed in regulating 23 wholesale and 275 retail water service providers. There was a wide array of tariffs, with a substantial number of providers charging below full cost recovery. Willingness-to-pay (WTP) surveys of consumers showed a majority unwilling to pay more, despite the low average share (0.76%) of water & wastewater charges in family budgets – much less than household spending on tobacco or alcohol. Such WTP results can be challenged: in Lisbon over the period 1977-2000 sharp increases in tariffs for residential users brought about no substantial decline in the volume supplied to end users.

New national legislation defines the main pricing principles - long-term progress to full cost recovery, promotion of efficient water use, protection of water quality, affordability, transparency, and the adoption of a nationwide tariff structure and common terminology. All providers are being encouraged to adopt these principles and tariff structures comprising a fixed element and four incremental blocks, with the possibility of a social price plan for low-income households and large families. It was intended that all providers would progressively move into a “convergence zone” of cost-recovering tariff levels.

The final part of this session contained two presentations on *abstraction charges*, dealing respectively with theory and practical application. **Prof Antonio Massarutto** (Universities of Udine and Bocconi, Italy)

¹² Operation and maintenance

considered how far theory could be a guide. As with user tariffs, abstraction charges have to contend with sustainability objectives that may conflict (ecological, economic, financial, ethical). He disagreed with the aim of meeting all objectives with one tariff, recalling the “Tinbergen Principle” that each policy objective needs a separate instrument. Some policy frameworks (including the EU Water Framework Directive) call for full cost recovery where total cost is a sum of financial, resource and environmental costs. He criticised this approach in the EU context, since WFD objectives require large infrastructure investment for which most relevant costs would be financial. Resource costs are opportunity costs, which necessarily vary by time and place, which complicates the practical implementation of a price which is supposed to reflect these costs. He questioned whether the response of water demand would be sufficient to warrant the use of resource cost pricing as an incentive for more efficient water use.

In agriculture, there seems to be a water price threshold, beyond which new, higher value, users move in, with no reduction in overall water demand. In many EU countries, abstraction charges have been used as a source of financial revenues, limited to the recovery of water resource administration, or earmarked for environmental spending. His conclusion was that abstraction charges had different effects depending on the point in the value chain being addressed. They were useful ways of creating earmarked funds and low cost sources of finance for water investments or to compensate low-value users that need to be phased out. But he was sceptical about the real value of summing resource and environmental costs and called for the concerted use of charges with other instruments (e.g. abstraction rights) for efficient resource allocation.

Patrick Thomas (National Water Agency, Brazil) complemented this with an account of the Brazilian approach to abstraction charges, inspired by the French model. Charges have been introduced in two river basins with Federal rivers so far¹³, and are shortly to be introduced in a third¹⁴. Charges are based on a formula including the volume of water taken and various coefficients such as water use efficiency, organic load and volume of water disposed of. Charges are accompanied by a system of permits for water abstraction, consumption and use for the dilution of effluents (with defined charges for each use). The charges have had a small impact on users (in Paraiba do Sul it amounts to 2.2% of the costs of water supply & sanitation agencies, 0.16% of costs of rice farmers, and 0.02% of the costs of industrial firms). Although the abstraction charge makes a useful contribution to the investment costs of water resource management, it needs to be supplemented with government budgets, loans, contributions from local companies, and other economic instruments. The key lessons from the Brazilian experience were that participation of users in decision-making was essential to ensure the political acceptability of the charges. Earmarking funds for investments to enhance water quality in the basin of origin was another crucial factor in the success of the reform.

Finally, **Jorge Rodriguez Romero** (European Commission, ENV D.2) expounded the implications of the Water Framework Directive for cost recovery and water pricing. Cost recovery was enshrined as a key principle (subject to the exemption allowed for “disproportionate costs” where these could be proved). Costs included financial, resource and environmental elements. Implementation should allow for social, environmental and economic effects of the impact of charging, as well as other “special” circumstances (the “Irish case”). In agriculture, cost recovery would have impacts on irrigation and the inputs used, on the choice of higher value crops, on the choice of improved irrigated farming methods. Reviewing the state of implementation of the WFD so far, he pointed out that a majority of the Member States were taking financial investment costs into account in their analysis, but only a minority could provide evidence of including resource and environmental costs. He also stressed that the definition of “water services” for which costs should be recovered had important implications for equity between countries and sectors.

¹³ Paraiba do Sul & Piracicaba-Capivari-Jundiá

¹⁴ Sao Francisco

Among the questions and points raised in the **open discussion** after this session were the following:

- In a debate on IBTs some participants thought they can be justified where marginal cost is increasing, while others believed that even if IBTs are not ideal it may be difficult to switch to a different system
- The closest approximation to the theoretically “ideal” water tariff proposed by Prof Boland is that found in the Flanders region of Belgium.
- There were several calls for connection fees to be the focus of subsidies to ensure access.
- Care should be taken to distinguish the *private good* component of water services (water supply and sewerage) from the *public good* element (wastewater treatment). This raises the question whether the two types should be charged on a different basis, and whether it was right for wastewater tariffs (for the public good) to be “hidden” in the water bill.
- Discussions on affordability should focus not only on *tariff levels*, but also on overall cost recovery in situations where consumption decreases due to tariff reforms and where the revenue base is shrinking because of demographic changes and industrial restructuring. Financing the modernisation of ageing and neglected installations and upgrading wastewater treatment is problematic in such circumstances.
- Billing and collection mechanisms should also be considered when tackling affordability questions, especially in developing countries. A question for OECD to look at is whether tariff structures have an effect on collection efficiency
- “affordability” yardsticks have little theoretical or empirical basis
- When considering abstraction charges for environmental objectives, policy-makers should decide whether they have a “Pigouvian”¹⁵ objective (to set charges that reflect the marginal cost of the externality created by water use and provision) or a Baumol and Oates¹⁶ objective (with specific environmental or revenue-raising objectives in mind).
- In the UK official Treasury view is that earmarking taxes for specific uses is undesirable in principle (a comment on the use of the proceeds of environmental taxes for re-investment in environmental improvements).
- In Australia there has been debate about whether large water users (industrial and even some households) should be able to trade their water entitlements, in addition to agriculture users that are already allowed to do so amongst them. – Water markets seen as a way to elicit scarcity values in scarcity situations

III. Agriculture water pricing and policies

This session, chaired by **Stefan Tangermann** (Director, OECD TAD), was opened by **Kevin Parris** (OECD TAD) with an account of the key issues of the OECD’s project component on water pricing for agriculture. The background is high and rapidly growing agricultural water use, the increasing exploitation of groundwater and high economic costs of agricultural water pollution. OECD’s work in this area is

¹⁵ after Arthur Pigou, a Cambridge welfare economist

¹⁶ Baumol & Oates, *The theory of environmental policy*, Cambridge University Press, 1988

currently focussed on tracking agricultural use of water, measuring the extent of public support for this, reviewing experience of policy on the management of agricultural water use, and identifying effective policy and market approaches in this respect.

In a wide-ranging presentation on the nexus of biofuel, energy and water, **Prof David Zilbermann** (University of California, Berkeley) observed that reforms typically depend on crises, and that efficient pricing usually occurs in the context of water transfers from rural to urban users. Market failures are pervasive, in the shape of subsidies, restrictions on the trading of water rights, high transactions costs, etc. The current increases in energy prices have implications for increases in water prices too, depending on whether users are upstream or downstream of hydro plants. The growing production of biofuels is increasing pressure on land and water. He argued that a carbon tax is superior to biofuel subsidies as a response to climate change. Energy policy should be harmonised with agricultural policy. These links create a research space for OECD in resource allocation, comparative policies, and the relation of energy and agricultural policies to trade and competitiveness.

Prof Mike Young (University of Adelaide, Australia) focussed on rural water pricing issues, against the (apparently) long term trend towards greater water shortage in Australia. Alluding to the “reform depends on crisis” view, he pointed out the social and economic costs incurred by Australia in failing to anticipate and adapt to the steady recent decline in renewable water supply. Well-designed water markets and institutions should be able to minimise the intrusion of regulation, and build in flexible response that would avoid knee-jerk reactions to crises.

He identified a number of issues worthy of consideration by OECD: should water rights be tradable and fully or partly defined; the balance between market mechanisms and restrictions to ration use in times of scarcity; whether uniform (“postage stamp”) prices should be set or prices varied by node in proportion to the local cost of delivery; whether prices should include the cost of downstream externalities caused by water use or externalities managed using separate incentive-based instruments; whether planning and management costs should be recovered in prices, etc. Several lessons could be drawn from the Australian experience: cross-subsidies and grants crowd out private investment and innovation; delivery management should be managed by a single state-wide entity or an array of interacting business entities each able to make independent decisions; and pricing competition among water supply utilities should be controlled by an independent price regulator so as to ensure competitive neutrality.

In a stylised case, a 10% decline in mean rainfall could result in a disproportionate (e.g. 30%) decline in the mean storage inflow. Allowing for evaporation and continued flow to the sea, this could reduce water available for consumptive use by 75%. Much rural water infrastructure will become redundant in the face of growing water scarcity, which raises questions about how its cost should be recovered, and whether it is feasible to expect the cost of maintaining the remainder to be borne by fewer and fewer rural users.

Seamus Parker (Queensland Dept of Natural Resources and Mines) explored in greater detail the Australian experience with agricultural water pricing policies. Prices should cover economic elements such as O&M, depreciation and return on assets, as well as environmental elements such as scarcity value, externalities and water management. All irrigation pricing has to cover “lower bound” cost recovery, and urban and industrial use is required to meet “upper bound” levels. Reforming prices have to be part of a larger process of reform including also institutions and entitlements. Due to increased prices and efficiency Australia has over 10 years shifted to the production of higher value crops and now uses 50% less water per hectare for the same volume of production.

He described a specific scheme of irrigated sugar cane in Queensland which has embarked on price reforms which would push them above the “lower bound” cost and remove the need for the Community Service Obligation (subsidy). He reflected that successful price reforms depend on understanding “legacy”

questions, negotiating each individual scheme, understanding the commodity background, mitigating shocks through “price pathing”, making the process transparent, and distinguishing elements that must be done from those that it would be “nice to do”.

Jonathan Fisher (Environment Agency of England and Wales) turned the spotlight on agricultural water pricing in England and Wales. At present the Environment Agency could only recover revenues up to its administrative costs, while the private water companies could recover their entire financial costs including those of replacing old infrastructure. Abstraction charges have been developed as an incentive – alongside other measures – to tackle a catchment’s abstraction in the few cases (c. 2%) where this was causing flow problems. He reported the results of major studies of the external environmental costs and benefits of agriculture as part of the background work for the EU WFD. Some key issues that arise from this are: taking account of income constraints; covering all water improvement measures; measuring all environmental benefits of a measure; and the estimation of sector contributions to pressures within River Basin Management Plans.

Chebets Maikut (IFAP-FAPI, Zambia) broadened the discussion to consider the global position on agricultural use of water. The need to double food production over the next 25 years from a severely constrained resource base, and in rivalry with other sectors for the use of water, calls for a revolution in policies towards water. There should be a shift from criteria of technical and economic efficiency towards the concept of “socio-environmental efficiency”, recognising the crucial role of women farmers and the ecosystem services of water. Keynotes of the approach should be IWRM¹⁷, stewardship programmes for farmers, innovative partnerships, fair pricing, upgrading efficiency and programmes to involve a range of stakeholders.

Mikiko Sugiura (University of Tokyo) described the application of water pricing in Japan, following the Sustainable Triangle for Irrigation water Management (STIM) model. The triangle consists of interactions between the quantity of water available, the cost of improving facilities, and the cost of labour in O&M. In typical Japanese conditions, water supply is normally ample and area-based pricing is rational and feasible. But during droughts water shortages are managed by local Land Improvement Districts (LIDs) which collect water fees based on full O&M and a part of investment cost, using a Time Clock for each rotation, and crediting return flows. The contribution of farmers to conservation, flood control and other public benefits is taken into account in the fees set.

Some of the points that arose in the **discussion** following this session were the following:

- The OECD Horizontal Project is well placed to consider agriculture and water issues in a broad context, in relation to all other uses
- It was questioned whether farmers have a right to water
- A carbon tax was recommended as an efficient and effective influence on behaviour, but might well encounter political resistance from the groups affected.
- Reforms to farm pricing are sensitive, and entail important social and environmental, as well as economic, issues. Specifically, changes to water prices would have an environmental as well as a social effect through their impact on the choice of crops, water use and other farm-level decisions. Transparency in the use of subsidies is crucial.

¹⁷ Integrated Water Resource Management

- In some countries many farmers get water from private wells, which affects how abstraction is managed, and places a premium on having good data on the use of this source.
- The Horizontal Project should also include work on good practices on the reuse of treated wastewater and other innovative options such as sharing infrastructure in rural and urban areas
- Policies for managing droughts depend on the context: while agricultural pricing may be appropriate, in urban areas rationing and suasion may be more effective
- National level abstraction charges and pollution taxes involve a high cost of implementation and may not be appropriate since most environmental problems are local. The right course for each local situation may involve a combination of administrative measures and provision of information, as well as specific local pricing.
- Water is a cross-cutting factor, relevant to all the Millennium Development Goals.
- Further guidance on the role of water pricing in agriculture would be very useful to EU Member States in 2009 when their attention turns to consideration of the draft River Basin Management Plans.
- Given significant resources and time constraints for OECD and Member states (and their delegates), OECD needs to ensure it can provide substantive economic analysis and information on any subject to make it worthwhile. This may require OECD to seek selective inputs from established experts who could deliver reports with the requisite data and analysis. OECD will need to choose its priorities in the light of its likely value added and comparative advantage.

IV. Innovative business models to finance water services

Barrie Stevens (OECD IFP) took the Chair for this final session. **Xavier Leflaive** (OECD ENV) presented the *problematique* and issues for discussion. The tasks facing water supply and sanitation services leave room for a variety of responses, e.g. demand management, adaptation of scale, public involvement of various kinds, and financial and technical innovation. He stressed that there is no “silver bullet” and there are likely to be complementarities between different options and models.

Harald Hiessl (Fraunhofer Institute, Germany) presented alternative scenarios of urban water infrastructure systems¹⁸. He drew attention to some strains and emerging problems in the existing conventional model – the age of existing systems, adaptation to climatic change, vulnerability to terrorism and natural disasters, growing scarcity and cost of fossil fuels and phosphates, more stringent pollution requirements, etc. Two small German municipalities have been used in the development of long term scenarios testing different degrees of decentralisation. The imminent need of major rehabilitation of aging systems presents an opportunity to try new sustainable models. Managing the transition will call for long term thinking and management of change. Changes are opening up in technology, organisations and institutions which call for more flexible systems than in the past and the ability to realise synergies between different utility sectors.

Jon Freedman and James Hotchkiss (General Electric Water & Process Technologies) explored the technological options more thoroughly. They contrasted the existing centralised system with a decentralised paradigm, the latter taking advantage of new safe, reliable and cost effective technologies, emphasizing plant rather than pipe, offering the same level of water quality to rural and urban regions, with

¹⁸ in the author’s absence, the presentation was introduced by Xavier Leflaive

more on-site water re-use and greater accountability for water use and re-use. Such systems could also be operated with less need for specialised expertise. In their view, the centralised option might continue to be preferred for large urban areas where municipally managed recycling is possible. But for extra-urban, low-impact urban infill and many industrial applications, on-site and decentralised water management may be the preferred option. The role of governments will be to create an enabling environment in which the above changes can play out, with policies encouraging re-use, clear standards on water quality, and financial recognition of the benefits that on-site solutions can give to communities.

Elaborating the above points, they cited a recent case in Atlanta where a private company took raw sewage from the municipality, and treated and recycled it for non-potable use. On-site recycling makes waste recovery feasible, which is not always possible with centralised plant. Although recycling and re-use is likely to have a higher capital cost, it is likely to be cheaper on a full life-cycle basis, especially if savings in the cost of sewer pipes are factored in.

George van Ramshorst (ABN Amro Bank) offered a commercial banker's perspective on water finance. His own bank formed a water team in 1996-7 but became disillusioned and dissolved the team in 2001. At present, lending to the water sector is considered on an *ad hoc* basis and the sector is no longer specifically targeted. The bank came to this view as a result of the specific problems and risks of this sector compared to others, notably long processes of project preparation and negotiation, long payback periods, the foreign exchange risk, and the prevalence of small-scale projects with heavy transactions costs.

Richard Franceys (Cranfield University, UK) presented his views on the regulatory implications of innovative business models, from the perspective of an academic and a regional member of the Consumer Council for Water in England and Wales (E&W). Economic regulation has delivered cost savings for E&W but is running into diminishing returns. The spread of metering is adding to costs, with modest expected water saving. The Regulator has made only limited attempts to introduce greater competition though "unbundling"¹⁹ and new "inset appointments"²⁰. The greater spread of "green" urban developments involving recycling, rainwater harvesting etc. pose issues for the regulator, e.g. who will operate and maintain the community systems. Water conservation and demand management is not rewarded under the present regulatory system. The Regulator's attempts to fine-tune the price cap system will narrow the scope to either outperform or underperform on revenue.

Turning his attention to the MDG agenda in developing countries, he asked if the European mindset had stifled the design and sale of watsan services that people really wanted and could afford. He illustrated the point through various options available to low income households. More innovative business models are needed to realise current ambitions to spread services to the poor.

Michael Deane (US Environmental Protection Agency) described the historical background to the present US system of water and wastewater financing. The bulk of water infrastructure financing in the U.S.A. derives from liquid, robust and localised capital markets. The key features of the model are the availability of annual federal grants to support state revolving funds for lending to local authorities. This provides "disciplined subsidies" for local water and wastewater projects. Municipal bonds are tax-exempt, which enables them to offer a lower coupon rate of interest. He argued that the existence of "contestable" markets for local water & sewerage services creates an environment conducive to efficiency. On the other hand, he pointed out the existence of a form of political risk in the US, where operators bidding for a contract spend time and money preparing bids that municipal officials may subsequently decide to substantially modify or withdraw. He cautioned that, though the U.S.A. has a very effective stock of water

¹⁹ separating out different parts of the water/sewerage value chain

²⁰ allowing large users currently served by one company to opt for services to be provided by another in an adjacent region.

infrastructure, its systems to a large extent are not sustainable under current financing and management practices.

Finally, **Fernando Gama** (Evensen Dodge International) gave an account of his firm's important role in the promotion of subnational financial markets in various countries. In general terms, many countries have ample funds available nationally, but face a shortage of funding for sub-sovereign authorities. Much sub-sovereign finance is enhanced in various ways (e.g. with guarantees, pooling or fiscal intercepts²¹). Structured finance has better prospects in these situations than the use of general obligation finance²². He drew on his firm's experience in Mexico to illustrate the impact of revenue intercepts and revolving funds on the growth of subnational capital markets, which have become strong enough to offer safe outlets for local savings such as pension funds. As a result, municipal finance tenors have been lengthened to 10 years or more, and interest rates have fallen.

Some of the points made in **discussion** were:

- Separate stormwater collection systems are only feasible if it is possible to store the stormwater – otherwise there is a likelihood of overcapacity and underuse for most of the time.
- As alternative wastewater business models, some of the options proposed for consideration were: allowing self treatment by certain users, allowing disconnection from sewers, promotion of common carriage in water and sewer networks, credits for recharging aquifers, etc. However, other participants warned of the need to uphold public safety standards in all these cases.

James Wimpenny (Rapporteur) concluded with the following observations²³ :

Data collection

- Data collection and presentation in the water sector is generally poor and politically charged. While it would be important for OECD to do more in this area, it should not underestimate the political forces present. Performance indicators influence aid flows, budgetary allocations, careers and financial incentives, to name a few major concerns. Having said this, data for use in benchmarking, shadow rating, peer group comparisons, “naming and shaming” etc would be valuable. Where there is insufficient cooperation from the agency concerned, the use of presumptive data could be tried. OECD could help with collating and analysing data on water, including the importance of water in member states (e.g. water as a % of costs of different sectors).
- Data collection and analysis should be relevant to policy-making, bearing in mind the high costs and likely diminishing returns from further data assembly.
- There is a fruitful area of work for OECD in collecting and analysing the performance of the new private operators that have arisen in the last decade alongside, and in some cases superseding, the Big Five.

²¹ An arrangement by the federal government to allow part of its transfers to a state government to be earmarked as a provision against possible default by the state government to a third party.

²² Which depends solely on the fiscal resources of the borrowing or issuing authority.

²³ This account combines comments made on both Days 1 and 2.

Tariffs, cost-recovery & subsidies

- The concept of sustainable cost recovery, as set out in the Camdessus Report²⁴, could be a realistic way to frame discussions of pricing. This starts from the reality that countries at all levels of wealth use water subsidies variously for social reasons, to reflect environmental benefits and other public goods, and/or as a farm support policy. The alter ego of the economic tariff is the justifiable subsidy. An important role for the water economist is to critically evaluate the argument for subsidies, and, where they are justified, to target and design them according to purpose, and consider how they can be funded transparently and sustainably.
- There is a large gulf between theory and practice in tariff setting, and in practice a huge variety of tariff levels and forms. Tariffs are used to serve several different objectives: although Prof Boland argued that it is possible for a single tariff to serve multiple aims, other speakers cited the Tinbergen proposition that every objective needed a separate instrument. It may be realistic to take a pragmatic view of tariffs as one economic instrument among a number of others available for the specific needs of each case, the selection depending on local factors and how far each instrument was “fit for purpose”. One speaker described this as “contextualising” the tariff issue.
- “Value perceptions” is a useful way of understanding factors lying behind demand functions, and helps to interpret willingness-to-pay data. This is a useful agenda for preparing the public for tariff reforms.
- Within the overriding theme of the Horizontal Project - the sound economic management of water resources - work on pricing and cost recovery could be organised and presented in a pragmatic way. Given the specific needs, constraints and potential in each situation, what instruments are available, which are most useful, and how do economic instruments need to be supported to maximise their prospects of success? It could be useful to conceptualise the problems using a matrix of policy aims and instruments.

Innovation

- The theme of innovation, comprising the four domains of business models, technology, regulation and finance, seems a very fertile topic for the OECD to pursue. Each of these domains interacted with each of the others, providing scope for synergies and scenario building. To get the best out of this topic, the various sides of the OECD engaged in the Horizontal Project would need to work very closely together.

Political economy of reform

- Several presentations on water pricing and agricultural water underlined the importance of considering the political economy of reform – opportunities and constraints, how to build coalitions for reform, what package of measures is best for each situation, what has worked, and why, etc.
- Very often, the keys to solving the problems of the water sector lay outside this sector, in such areas as housing, trade, agriculture, industrialisation, tourism, etc. Trade is an important driver, and work on the “water footprint” of different activities enabled a more sophisticated debate on these issues, though the implications of “virtual water” in trade are complicated.

²⁴ Winpenny, “*Financing water for all: Report of the World Panel on Financing Water Infrastructure*”. 2003

- OECD member states should be open to lessons to be drawn from the experience of non-OECD countries in water management.

The Expert Meeting ended with some closing remarks by **Helen Mountford** (CNRO Division Head, Environment Directorate). She indicated the further steps to be taken as a result of the meeting:

- Jim Winpenny will produce a report on the meeting, to be circulated to participants for feedback. This will have the status of a Rapporteur's report, issued under his name, with his final responsibility for its content.
- The final version of the report, as well as the slides from presenters will be posted on the OECD website: www.oecd.org/water. These will include slides from the Secretariat outlining the outputs of the horizontal water project and timing thereof.
- Many participants called for a second Expert Meeting during the life of the Horizontal Project. While this was not originally foreseen in the work plan and budget of the Project, given the extremely useful discussions and input from the current Expert Meeting the Secretariat is considering ways in which it may become possible.
- A high level conference is planned to highlight the results of the Project in the fall of 2008. As outputs of the Horizontal Project appear they will also feature in various other international outlets throughout 2008, culminating in their presentation at the 5th World Water Forum in March 2009.
- Until then, what we take from this meeting is the strong endorsement of the value added that OECD may provide with its work under the Horizontal Project, and the need for this work to continue beyond the currently defined two-year programme. We therefore hope that the Delegates who agree with this view may take this message back to their capitals so that it may be reflected in the definition of the Secretariat's future work programme.