

PROGRESS REPORT No 1

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FINANCING WATER FOR AGRICULTURE

Working Group on Financing Water for Agriculture

Financing Water for Agriculture

Progress Report No 1

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Acronyms & abbreviations

<i>AfDB</i>	<i>African Development Bank</i>
<i>AsDB</i>	<i>Asian Development Bank</i>
<i>DFI</i>	<i>Decentralised financing institution</i>
<i>FAO</i>	<i>Food and Agriculture Organisation (of the United Nations)</i>
<i>GWP</i>	<i>Global Water Partnership</i>
<i>IADB</i>	<i>Inter-American Development Bank</i>
<i>IsDB</i>	<i>Islamic Development Bank</i>
<i>IFAD</i>	<i>International Fund for Agricultural Development</i>
<i>IFC</i>	<i>International Finance Corporation</i>
<i>IFI</i>	<i>International Financial Institution</i>
<i>IPTRID</i>	<i>International Programme for Tropical Research on Irrigation & Drainage</i>
<i>IWMI</i>	<i>International Water Management Institute</i>
<i>MFI</i>	<i>Microfinance institution</i>
<i>PPP</i>	<i>Public-Private Partnership</i>
<i>WTO</i>	<i>World Trade Organisation</i>
<i>WWC</i>	<i>World Water Council</i>

Acknowledgements

The sponsors of the Working Group would like to thank the many organisations and individuals whose material support made this venture possible. This is a Progress Report prepared for the 4th World Water Forum in Mexico, March 2006. Further work will be carried out after the Forum taking into account the views expressed at that event.

This Progress Report does not necessarily reflect the official position of each of the sponsors in every respect. It is offered as a distillation of information received so far, and as a contribution to future policy-making on this topic.

Draft Executive Summary

The Working Group on Financing Water for Agriculture was convened by a number of international sponsors¹ to consider the specific problems of financing water for agriculture and to make proposals to improve its funding prospects. Water for agriculture is significantly different from water for household use, and deserves separate consideration and its own solutions.

The WG took a broad view of agriculture, including related rural sectors and communities and households using water for productive purposes. The topic includes public irrigation schemes, groundwater development, use of catchments, improvements of rainfed systems, processing, aquaculture, and other rural activities involving the use of water.

The Broad Picture

In the coming decades feeding the growing world population and satisfying its need for raw materials will call for increased output from both irrigated and rainfed agriculture. Some of this will come from an increase in the irrigated acreage, though the scope for this will be much more limited than in the past. The larger part of extra output will have to come from the more efficient use of water resources already being exploited, epitomised in the slogan *more crop per drop*.

Agriculture is by far the largest user of the world's water and can expect growing competition at the margin from other sectors for its use, particularly from the encroachment of growing cities onto farmland. More crop per drop implies the reduction of losses from the transport and distribution of irrigation water, and its more efficient application to crops. The more efficient use of water in rainfed systems will have a major part to play, in some cases supplemented by irrigation water. Communities and households will need to capture more water through catchments for local productive purposes.

These developments call for major changes in the way in which water is used in agriculture and rural activities, and have major cost and financing implications. It has been estimated that the annual costs of managing water resources to meet the MDG Hunger goals could lie in the region of \$45-50 billion over the next ten years, rising to \$65-70 billion thereafter. These costs relate to conventional irrigation, upgrading rainfed systems, and complementary investments in soil and water management, research, extension, etc. Investment is needed in the rehabilitation and adaptation of present infrastructure as well as the creation of new structures and systems. Some investment, especially in major infrastructure, will fall to governments and public agencies. Much, however, will be undertaken by private farmers at all scales and of varying types.

Water for agriculture is currently financed from a mixture of sources. The prospects for a major expansion of government subsidies or guarantees are not bright, given fiscal

¹ GWP, WWC, World Bank, FAO, IFAD and IWMI.

constraints and the many competing claims on the public purse. However, other potential sources – oda, MFI loans, commercial bank loans, small-scale informal sources, etc – are likely to be in more elastic supply. *Finance of all kinds will, however, be conditional on supportive policies, reformed institutions, sound projects and creditworthy borrowers. In order to attract the required amount and types of funds the sector as a whole will need drastic reform.*

One of the fundamental obstacles the sector faces in attracting finance is the universal fact that irrigation water provided from public schemes is either free or massively under-priced. Free or cheap water for farmers is an ingrained habit which in many countries is seen as a necessary part of national policies of cheap food and food self-sufficiency. Such policies have a strong emotional and political appeal, but the use of cheap water in their pursuit may be unsustainable and could produce distortions which become self-destructive. The Aral Sea is an extreme example of the social and environmental results of the reckless use of water for irrigation.

Food security, which is an understandable concern of governments, entails universal access and *entitlement* to food, a good national system of storage and transport, and purchasing power to make imports as required. Barriers to trade in foodstuffs threaten food security and induce governments to follow policies of self-sufficiency which lead to an unsustainable and uneconomical use of water. As a step in the right direction *the UN should take the lead in excluding staple foodstuffs from any future cases where economic sanctions were imposed on a country.*

In most cases irrigation water prices are well below the cost even of operating and maintaining the infrastructure, and make no contribution to recovering capital costs. This does not discourage farmers from investing in facilities for their own private use, but does explain why there has been so little commercial finance for the supply of irrigation water for sale. *Many public irrigation agencies are effectively bankrupt and have difficulty attracting finance without large public subsidies. In this situation not enough new and replacement investment takes place and the infrastructure is condemned to a lingering death.*

Financing prospects also depend on forces outside the control of farmers and their national governments. The prices of internationally-traded crops are set in world markets, and even domestically-consumed products are influenced by external trading conditions. International trade is not a level playing field: countries use a combination of import and export barriers, export subsidies and exchange rate practices to influence the terms of trade in their favour. Developing countries often complain about the trading practices of others, though some of them gain from preferential access to important markets.

Complexity: no “one size fits all” solutions

Water is used in agriculture in a great variety of situations: the popular image of rice farmers working in paddy fields in large public irrigation command areas only focuses on part of a large mosaic, each component of which needs to be properly funded. Aside from large public irrigation schemes, a major part of this sector consists of privately-financed tubewells using groundwater. Commercial farms and estates often have their own

diversion and storage structures. At the other extreme are small farmers and rural households using various sources including catchments, some temporary, or in combination. *The sector is complex, and proposals should avoid “one size fits all” solutions.* One example is the growing importance of women farmers, who represent a specific target group for finance.

Financing also needs to recognise the many different functions entailed in water for agriculture. Apart from providing water from surface or underground sources for irrigating crops and watering livestock, the topic includes drainage, water quality management, the enhancement of rainfed farming, aquaculture, multipurpose projects including flood control and hydropower, and water supply to rural households for productive use, amongst other aspects. Agriculture also performs social functions which may justify public subsidy. Farming is a social safety net, sustaining both dependent families and returning migrant workers in their retirement, sickness or unemployment.

The links and synergies between these different aspects are stressed in the Integrated Water Resource Management approach which is rapidly gaining ground among policymakers. The creation of IWRM data, plans and coordination capacity itself needs proper funding. Some of the abovementioned functions are easier to finance than others, and for certain of them (e.g. provision of “public goods” such as flood control and data collection) public funding will be necessary. *The various constituent parts of water for agriculture should hang together financially.*

Change is urgent and unavoidable

The future shape of water supply for irrigation will be determined by a growing scarcity of water and competition for its use. Given the high degree of physical and economic water scarcity and the growing demands and competition for water from other sectors, there are fewer opportunities to expand irrigated areas. The emphasis must therefore shift to improving the productivity of water, and access to water by poor people, within the overall framework of an integrated, holistic, approach to water resources management.

The next generation of investments will be different from the last. On present trends there will be few new publicly financed irrigation schemes involving surface water systems, due to the high and rising cost of new schemes, low agricultural commodity prices which depresses economic returns, environmental costs of water demand on rivers and aquifers, severe pollution from poorly managed irrigation schemes, and the fiscal constraints on continued public funding. Instead, the keynote actions are modernisation & rehabilitation of current systems, improved operation and management and a review of the roles of institutions involved in irrigation.

Urbanisation is changing the economic and social environment of agriculture. On the one hand it creates a growing demand for crops and products produced on a commercial scale and to the standards expected by a sophisticated urban market. This is increasingly the domain of highly capitalised and commercially-oriented farmers, well able to afford the necessary water infrastructure. But there is another side to urbanisation, where workers (usually male) migrate to the cities in search of jobs, leaving their dependent families behind on farms to survive on remittances, supplemented by subsistence farming.

Transformation of institutions: new wine in new bottles

Existing irrigation agencies and other supply-side agencies will need to change to adapt to these new demands. They also have historical legacies of failure and inefficiency to recoup. Reform programmes should be sufficiently ambitious and challenging, but also realistic, and it is naïve to expect the reform agenda to be driven exclusively by the state or existing vested interests. The reform movement needs to involve stakeholders from many walks of society, and be eclectic in its choice of pathways and models, choosing what works, even if it is not ideal.

Irrigation and other supply-side agencies need to critically review what they are there to do (their “mission statement”) in the light of changing demands on their services, and the growth of broader concerns for poverty-reduction, environmental sustainability and other factors. They should look more broadly at who their stakeholders are, listen to their core clientele - the farmers - and become more responsive to these various demands. They should be willing to take account of criticisms made and to make appropriate changes, which is the essence of accountability. *Finance of all kinds will, however, be conditional on supportive policies, reformed institutions, sound projects and creditworthy borrowers. In order to attract the required amount and types of funds the sector as a whole will need drastic reform.*

As for Water User Associations, the trend to give them more delegated responsibilities needs to be accompanied by sufficient delegation of powers (“voice and choice”) to enable the WUAs to function effectively in the new environment.

If serious changes and reforms are to be made in agricultural water institutions, a strong focus will be required on capacity development, including participation, empowerment, technical assistance and organisational development. The re-education and training of staff is an important part of this. Staff exchanges, benchmarking, “south-south” cooperation, twinning, and other kinds of technical assistance all have a potential role to play.

Adapting conventional sources of funds

Much of the current flow of finance for investment in water for agriculture comes from governments and parastatals, donor agencies and IFIs. Recurrent costs (O&M) are covered by government subsidies and user charges. These will remain the first recourse of the sector in future. However, future flows even at current volumes, let alone increased amounts, cannot be taken for granted without changes in the way the sector is operated. The funding sources themselves will need to review the way they work in this area in order to play their part in supporting the needed changes.

Revenue raised from users is a grossly under-tapped source of finance with great potential, and is the only really sustainable source of finance for recurrent operations. However, service agencies will need to be more customer-oriented and provide a better service if this potential is to be realised. Increased revenues from users will be a measure of the reforms, as well as a contributor to them.

The re-evaluation could appropriately start with governments. Their budgets for this sector are often underspent, and tend to be largely spent on wages and salaries at the expense of materials and replacement items. Future spending should be more *functional* to support necessary reforms. Departments should examine the reasons for any underspending that occurs and take action to remove administrative blockages.

External aid will continue to be needed in this sector, though on a more selective basis than in the past. Donor and lending agencies have much to learn from the past disappointing performance of many agricultural projects. Aid is likely to be appropriate in the following roles: support for research and the collection and dissemination of information; facilitation rather than direct provision; leverage and catalysis rather than blanket funding; training and capacity building; providing initial equity & “seed” capital; dialogue & advice on improving the enabling environment, etc.

IFIs are re-positioning themselves for lending to the improvement and modernisation of existing irrigation systems, rather than creating new ones. So far, experience in this new style of operation is limited. Although surface irrigation is likely to be the largest component of IFI lending for water management, there are also major financing needs for groundwater development, drainage and water quality management, rainfed agriculture and multi-purpose operations.

The appraisal, planning and implementation of dams and other major works financed by IFIs and other lenders now has to conform with much more comprehensive and rigorous standards, involving a wider range of stakeholders, and more lengthy consultation, than previously. Projects that emerge from this process are likely to be more sustainable and acceptable than an earlier generation of schemes. However, there is a risk that “the best is the enemy of the good” insofar as lending agencies, banks and private investors are deterred from lending by “reputational risk”. For their part, some borrowing countries despair of the delays and uncertainties imposed by the new procedures, and either go it alone without IFI support, or fail to implement urgently-needed projects.

In order to secure finance for essential major infrastructure from IFIs and commercial lenders, working arrangements are required which take account of key elements of the World Commission on Dams report. However these should avoid unnecessarily complex and time-consuming procedures which deter both financiers and borrowers and work against the needs of the poor. There should be a specific study of the experience of financing dams and other major hydraulic projects concluded since 2000 with IFI involvement.

Water charges raise essential funds for the operation and maintenance of systems, and turn passive recipients of water into paying customers, potentially with an important voice in how services are provided. Recently the case for raising irrigation charges has been clouded by a controversy over how far tariffs can influence farmer’s use of water. It is argued that for charges to alter farmers’ behaviour they would need to be very much higher than at present, which would run into stiff resistance. There would also have to be some credible system of measuring water use and an effective collection system.

However, accepting the argument that charges may not greatly influence farmers' use of water in no way weakens the case for recovering more costs from users to raise essential funds for O&M and eventually capital costs of systems. But the timing and context of raising such charges are crucial.

Farmers are more likely to acquiesce in paying higher charges if there is a good prospect of improved service. This is unlikely where such revenues flow back to the Treasury and the irrigation agency has no control over their use. The success of a more active charging policy depends on either giving the irrigation authority financial autonomy, so that farmers would see direct benefit from higher charges, or enabling farmers' organisations to hire irrigation services on their own account. In either type of regime, farmers would be transformed into clients who "owned" the process of reform, and would be able to exert pressure on the authority to make its operations efficient in order to keep costs down.

Further study is desirable of cases where irrigation tariff reform has been successfully introduced, and their lessons for implementation

Developing innovative solutions

The key to involving a wider range of financial sources in water for agriculture is to identify the specific risks of this sector to investors and lenders, and to address these risks through financing structures. There is scope for co-financing from various sources, with each funder assuming appropriate parts of the risk.

Lenders and investors in agriculture expose themselves to a variety of risks. Some of these are generic and not specific to this sector, though they may apply with greater force in agriculture than elsewhere. Some risks affect individual producers, others concern the whole sector. The main risks to note are: project profile & cash flow; production, client & credit; market; environmental; climatic; foreign exchange; sub-sovereign; political, contractual & regulatory.

These risks can be addressed and mitigated by a mixture of measures. In some cases this entails designing the project to make it more risk-proof. In other cases the provision of complementary infrastructure would reduce risk. In the realm of financial engineering the options include: structuring the project finance package; insurance, guarantees, choice of suitable loan terms, use of derivatives; adequate capitalization and liquidity of the borrower; collective security; Central Bank action to refinance illiquid loans, etc.

There are innumerable examples of private investors in groundwater development for their own use, and – in South Asia- for sale to neighbouring farmers. But private finance of irrigation water for sale on a commercial basis is less common. There are now a number of private companies with service and management contracts with public irrigation agencies, and a smaller number of private contracts involving commercial risk on investment, with costs recovered from users. In most cases the motive for seeking private sector participation has been a desire by governments to reduce the level of subsidies going to operate and maintain irrigation and drainage systems. Where PPPs have happened, farmers tend to be organised into groups or associations.

Although farmers' needs for seasonal credit are widely catered for from a variety of sources, the situation for term finance is very different. In developing countries there is frequently a shortage of institutions offering term finance to farmers, apart from large commercial operators such as plantations and agro-business ventures.

This is a serious brake on rural development, which reflects the financial markets' view of the risks in agricultural term lending, compared to financing other sectors. These risks are of different types, and are very situation-specific. Irrigation and storage facilities may actually *reduce* a farmer's risk, while financing tree crop plantations is risky. Loans to experienced farmers for machinery and equipment are not necessarily more risky than seasonal credit. Financing the expansion of existing activities is less risky than funding start-ups or diversification into new occupations. Successful providers of term finance tend to operate in areas with good infrastructure (including irrigation) and proximity to markets or processing companies.

Despite its spread into other sectors, microfinance has made limited penetration into agriculture. One reason is that some governments cap interest rates that can be charged to small farmers, which makes such loans unprofitable to commercial lenders given the high transaction costs typical of this sector. Another reason is the lack of a sufficient density of clientele, especially those needing credit for non-farm activities. Countries where microfinance has been successful in rural areas, such as Bangladesh, Bolivia and Indonesia, have allowed "policy space" to decentralised finance, have an adequate legal and regulatory framework, and possess the necessary density of market for its services. Public authorities and agencies have an important role in the promotion of MFIs and DFIs but this is often most usefully exercised in indirect ways, such as created an *enabling environment*. Well-meaning interventions should avoid the risk of crowding out local players and thereby suppressing the growth of local capital markets.

Governments, donors, and IFIs, with the support of international networks and other stakeholders, should develop appropriate fora (e.g. Round Tables) involving local financial service providers to identify ways of promoting microfinance in water for agriculture. Governments should also review the impact of existing credit and capital market controls on the potential development of a microfinance market.

Preface

When we try and set the context for the problem of financing water for agriculture over the next two decades or so we find ourselves juggling with many major imponderables. Among the factors that will affect agriculture and investment in water services are population growth, climatic changes and variability, changes in material living standards, advances in agricultural science and technology, global health status, changes in lifestyle, the continued march of urbanisation, the growing competition for water resources, etc.

To take just one factor, the global trade and macro-economic environment has a major impact on agriculture. In recent decades major countries such as India and China have largely achieved food self sufficiency but with the prospect of their rapid economic growth and urbanisation, not to mention growing water stresses, it is not out of the question that they will sooner or later become major food importers again. This would transform the market prospects for food products.

In the same vein, observers have been examining the impact of the present Doha round of trade negotiations, which are likely to bring modest benefits to agricultural trade over the next ten years. However, the main beneficiaries are likely to be a few middle income countries rather than the poor, and farmers may benefit while food importing countries may suffer overall. The future pattern of trade will impose its water “footprint” on exporting and importing countries according to the water content of their trade.

We are not soothsayers and cannot predict how the Big Picture will evolve in all its complex detail. Our modest aim is to bring some suggestions forward to governments and stakeholders so that the pot of investment for water for agriculture can be expanded.

Our main concern has been finance for water as a productive input used by farmers, rural households and others. But it is relevant to consider the interests of consumers of food and other farm products. The very first Millennium Development Goal addresses poverty and hunger. Of the 1.2 billion living below the poverty line, the largest number – 900 million - live in rural areas. Not all of these are farmers - many are landless, and rely on wage employment or products obtained from the local environment. The remaining 300 million of the world’s poor currently living in urban areas also have a stake in agriculture, depending as they do on access to plentiful and affordable food.

There are many preconceptions of farmers, which regularly need to be challenged. Farmers are a diverse group, operating in very different environments. They tend to be misunderstood, ignored or patronised by officialdom, banks, lending agencies and their political representatives. I hope that our report helps to convince readers of the variety and complexity of this sector, its different needs, and how all parties can contribute.

The Working Group’s regional Consultations held so far have raised a number of key issues. The consultation process will continue after the Mexico Forum to further address these points and follow up on promising approaches. Its eventual aim is to contribute to an agenda for further action by members of the international community in its many constituents.

I. Setting the scene

1. Overview & Scope of Work

1.1. Overview

In the coming decades feeding the growing world population and satisfying its need for raw materials will call for increased output from irrigated agriculture. Some of this [FAO estimates...] will come from an increase in the irrigated acreage, though the scope for this will be much more limited than in the past. The larger part of extra output will have to come from the more efficient use of water resources already being exploited, epitomised in the slogan *more crop per drop*.

Agriculture is by far the largest user of the world's water and can expect growing competition at the margin from other sectors for its use², particularly from the encroachment of growing cities onto farmland. More crop per drop implies the reduction of losses from the transport and distribution of irrigation water, and its more efficient application to crops through more widespread use of sprinkler and drip irrigation methods. The more efficient use of water in rainfed systems will also have a part to play, in some cases supplemented by irrigation water. Communities and households will also need to capture more water through catchments, for local productive purposes.

These developments call for major changes in the way in which water is used in agriculture and rural activities. They also have major cost and financing implications. It has been estimated that the annual costs of managing water resources to meet the MDG Hunger goals could lie in the region of \$45-50 billion over the next ten years, rising to \$65-70 billion thereafter. These costs relate to conventional irrigation, upgrading rainfed systems, and complementary investments in soil and water management, research, extension, etc. Investment is needed in the rehabilitation and adaptation of present infrastructure as well as the creation of new structures and systems. Some investment, especially in major infrastructure, will fall to governments and public agencies. Much, however, will be undertaken by private farmers at all scales and of varying types.

All farmers are water users in various forms, hence the potential scope of the enquiry is very broad.

Water for agriculture is a diverse and complicated topic and it is not sensible to over-generalise about it. It is currently financed from a mixture of sources, and this is likely to continue. The prospects for a major expansion of government subsidies or guarantees are not bright, given fiscal constraints and the many competing claims on the public purse. However, other potential sources – ODA, MFI loans, commercial bank loans, small-scale informal sources, etc – are likely to be in more elastic supply. Finance of all kinds will, however, be *conditional* - on supportive policies, reformed institutions, sound projects and creditworthy borrowers. In order to attract the required amount and types of funds the sector as a whole will need drastic reform.

² Molle & Berkoff, 2006

One of the fundamental obstacles the sector faces in attracting finance is the universal fact that irrigation water provided from public schemes is either free or massively under-priced. In most cases prices are well below the cost even of operating and maintaining the infrastructure, and make no contribution to recovering capital costs. This does not discourage farmers from investing in facilities for their own private use, but does explain why there has been so little private equity investment in the supply of irrigation water, and why public agencies have difficulty attracting finance without large public subsidies.

Free or cheap water for farmers is an ingrained habit which in many countries is seen as a necessary part of national policies of cheap food and food self-sufficiency. Such policies have a strong emotional and political appeal, but the use of cheap water in their pursuit may be unsustainable and could produce distortions which become self-destructive.

Financing prospects also depend on forces outside the control of farmers and their national governments. The prices of internationally-traded crops are set in world markets, and even domestically-consumed products are influenced by external trading conditions. International trade is not, of course, a level playing field: other countries use a combination of import and export barriers, and export subsidies, to distort the terms of trade in their favour (as they perceive it). Developing countries often complain about these trading practices, though they may equally gain from preferential access to certain markets.

The Working Group has broached issues such as these, drawing on the resources of its sponsoring institutions and the views of stakeholders at three regional consultations. The subject is broad and complex, the issues are knotty, and solutions often difficult, requiring great political will. Consequently, this report does not make categorical recommendations, nor offer specific proposals tested for their feasibility.

Its purpose instead is to flag a number of key issues in this area, raise questions that need to be further addressed, and indicate some promising lines of approach. In this way the Report aims to contribute to an agenda for further action by members of the international community – including national governments, UN agencies, trade and cooperation ministries, financial agencies, NGOs, bankers, farmers' representatives and other stakeholders in this vital topic.

1.2. Origins of the Enquiry

The Working Group (WG) has been sponsored by the Global Water Partnership (GWP) and the World Water Council (WWC), and is also supported by the World Bank, FAO, IFAD and IWMI. Ismael Serageldin, President of the Biblioteca Alexandrina in Egypt and former Vice-President of the World Bank, has chaired the Group. Annex 1 provides information on the composition and working modalities of the Working Group.

The purpose of the WG has been to continue and extend the work of the World Panel on Financing Water Infrastructure³ by considering in greater depth the specific problems of financing water in agriculture and related rural activities and livelihoods. References to this topic made by the World Panel appear in Box 1.

Box 1. Extracts from “Financing Water for All”(pp. 38-39)

The panel’s intention has been to attempt a balance between the needs of different water sub-sectors. This has not been easy. Inevitably, because of the prominence given to reducing the service deficits of the poor in the MDG and Earth Summit, the needs of poor households have absorbed much of the panel’s time. Each sub-sector requires its own distinctive approach, and many solutions are sector-specific. In particular, the financing needs of irrigation is a complicated and stubborn problem. With these reservations, the panel believes that its proposals would have financial benefits for each of the main branches of the water sector, and are summarised below.....

Irrigation

The reengagement of MFIs and donors with dams and other major hydraulic works would improve water and food security for many farmers, especially in Africa. Public irrigation agencies are one type of sub-sovereign entity that could benefit from more financial autonomy, though major reforms are going to be needed to improve their creditworthiness. In selected schemes where conditions are favourable, private concessions are feasible (and are being invited); these would benefit from the extended use of insurance and guarantee instruments, and from the proposed liquidity facility. Small-scale farmer-financed schemes would benefit from the proposals to develop local capital markets, micro-credit and development finance institutions.....

Hydropower

Most large hydro schemes are in the public sector and dependent on public investment, supplemented by foreign aid and international/national borrowing. A minority of projects, mainly small, run-of-the-river schemes, are private investments. The proposal on dams would encourage more MFI and donor support. Commercial bank lending would benefit from the wider use of insurance and guarantee products, and from wider use of the MFIs’ B-loan and Preferred Creditor Status products. Bond issues for hydro would also gain from more use of Partial Credit Guarantees, which would extend maturities and lower rates.....

1.3. Scope of work

The broad aim of the Working Group has been to consider and recommend ways of increasing the flow of finance, and access to it on acceptable terms, for water users in agriculture, related rural sectors, and communities or households using water for directly productive and livelihood purposes. Addressing the Millennium Development Goals for poverty or hunger hinges to a large degree on tackling the issues involved in financing water development and reforming water governance.

The Group has taken a broad view of the sector, following the Integrated Water Resource Management approach, taking on board the financial needs of the whole water cycle as it

³ Popularly known as the Camdessus Panel, which issued its report, “Financing Water for All” in 2003, presented to the Kyoto 3rd World Water Forum.

affects agriculture. This includes upstream and watershed interventions and problems caused by downstream effluent, such as drainage and pollution abatement. Its

Consultations focussed in practice on the following major issues:

- Financing needs, sources and future options for investment in the infrastructure of water resource management (e.g. storage & transfer) and agricultural irrigation (large and small).
- Funding needs at local, community and household levels for productive water use, and livelihood & food security purposes
- Specific examples and case studies deemed to be of wider interest. Particular attention was paid to innovative financing methods, the use of unconventional sources, and ways of combining different types of funds.

In principle, the scope of work includes funding for the infrastructure, institutions and services involved in water management for agriculture, related rural activities, and the use of productive water for rural livelihoods. This includes:

- Finance for both public and private parties, from any source
- Capital expenditure in new schemes; modernisation, rehabilitation, adaptation of existing projects; installation of new management systems; generating sufficient revenues to operate and maintain schemes efficiently.
- Financial needs of the whole water cycle as it affects agriculture, including upstream and watershed interventions and problems caused by downstream effluent (drainage and pollution abatement).
- Funding interventions at various scales (international, transboundary, national, regional/district, municipal/local, household), depending on the level of management involved (basins/catchments, farm level, small and large scale irrigation systems, household yards and subsistence plots, etc.)
- On-farm and village-level agricultural processing, where these have important water implications
- Water-intensive rural activities such as aquaculture, which are closely related to agriculture
- The “productive” use of water by rural households for livelihood purposes and finance for the management of water for the benefit of the rural poor, in their various roles.

In practice, the Group has only been able to touch on some of these topics.

1.4. Distinctive features of Financing Water for Agriculture

From the viewpoint of financing, water for agriculture has certain distinctive features compared with water and sanitation (W&S) for household use.

Magnitude. The amount of water involved is very much larger and, on a per head basis, the infrastructure necessary for supply and distribution (plus drainage and disposal) is more expensive.

A productive input. The water is supplied for productive, rather than “basic needs” or lifestyle purposes. This means that it can have important repercussions on local economic

and social development. It also implies that the users of the water – overwhelmingly private farmers and other rural enterprises – see water as a productive input and (at least potentially) as a cost of production. This should create the basis for economic water charging, but this has been widely undermined by use of irrigation water for the production of low-value foodgrains and the politicisation of water and energy prices in many countries (see next point).

Financial versus economic returns. There is commonly a discrepancy between the financial performance of irrigation agencies (usually very poor) and their economic rates of return taking account of all benefits and costs, reflecting their social values. This also applies to many W&S cases, but for different reasons. In irrigation, the situation arises from various causes. The supply of water free or at sub-economic cost may be seen as a means of promoting food self sufficiency, settling newly developed areas, appeasing a farming lobby, etc. Or it may be a way of compensating for food prices that are kept low for social reasons, or which are squeezed by “unfair” foreign imports.

Unattractive to private finance. Private finance has been more wary of investment in selling water to agriculturalists than in the case of W&S. The subsidy mentality is more pervasive, and very few public irrigation schemes are fit for privatisation (though there are many cases of PPP involving the supply of services for a fee).

Farmers’ own investments. On the other hand, there has been widespread investment by farmers themselves in water for their own use (particularly groundwater and small diversion and storage schemes). Notwithstanding this point, this option depends on local circumstances, and not all farmers are able to take these matters into their own hands – sometimes water can only be obtained by collective or public action.

Involvement of water users. Agricultural water users need to be much more closely involved in decisions about water allocations and the operation and maintenance of their systems than is the case for W&S. There is an important role for farmers’ associations, and specifically Water User Associations with some delegated powers, which might include revenue collection and discretion over some expenditures.

Specific risks. Supplying water for agriculture has its own set of risks. The water resource itself is at the mercy of climatic fluctuations and, in the event of scarcity, other sectors may take priority. Irrigation clients are farmers whose incomes are often affected by natural forces beyond their control. These specific risks are further discussed in section 8.1.

2. Financing Water for Agriculture: the starting point

Much has been written and said on the role of agriculture, and specifically irrigated agriculture, in contributing to future global demands for food and raw materials. The MDG for alleviation of Hunger has added urgency to this debate. Apart from the topic of cost recovery from farmers through water prices, which has a huge literature, financing has received less attention. This chapter summarises some relevant aspects, including financial needs, current sources of funds, pricing and cost recovery, profitability and returns, and other salient matters.

2.1. Size of financing needs

The WWC/GWP Vision and Framework for Action in 2000, estimated that the annual investment requirements for agricultural water would need to rise from the current levels, variously estimated to be in the range \$25-30 bn., to \$40 bn. by 2025. The original estimates were based on very rough calculations, which have not yet been seriously refined. Nevertheless, these figures are retained in the World Bank's current strategy paper⁴. Some observers contest these estimates, believing that there has been past over-investment in public irrigation schemes, that great gains in productivity could be obtained from existing infrastructure without major new investment, but with improvements in farm practices, responding to better incentives.

In a recent systematic analysis of the options for meeting the MDG for Hunger the annual investment and running cost of all water resource related management was estimated to be (US\$ billion) 47 in the period 2005-2015, rising to 67 in 2015-2030, and falling back to 58 in 2030-2050. These costs are for various types of investment, including conventional irrigation, the upgrading of rainfed systems through small-scale water management and *in situ* soil and water management, agricultural research, extension services, and supporting development of rural roads⁵.

Future investment in agricultural water management is likely to be very different from the historic pattern. Much future investment is likely to be in the modernisation and rehabilitation of existing assets and investment in new hydraulic infrastructure, such as dams, is likely to be more selective than previously. In particular, there will be a great need for investment in increased productivity ("crop per drop") especially in rain-fed systems:

"Large investments are needed now, and a first estimate indicates that 47 billion US\$ per year is required to enable the release of 1,600 km²/year in rainfed farming, 270 km²/year in irrigation development and 350 km²/year of crop-per-drop savings."
(Rockstrom, et. al. 2005, p. 34)

Investment requirements will reflect the economics of different systems: the next generation of hard and soft-ware projects will have to demonstrate more sustainability as well as efficient and cost-effective. This will affect the size of investment in each case.

⁴ *Directions in Development: Re-engaging in agricultural water management: challenges, opportunities and trade-offs*. Draft version, May 2005.

⁵ Rockstrom, et. al., Stockholm Environment Institute, 2005.

External financing needs will also depend on the feasibility of internal contributions through cash or kind, and how far revenues are retained in the system rather than siphoned off for general purposes.

It is not just the amount of finance that is of concern: the timing of cash flow and its scheduling are also crucial. Many large schemes, especially in Asia, require upgrading to be financed on a continuous basis, over and above what is recovered for O&M. Where finance for upgrading is made available in large indivisible payments it tends to be untargeted and spent on quick returns and this results in system failure. Upgrading should be treated as part of an asset management strategy, needing the release of smoother flows of finance.

2.2. Current sources of finance

The funding of large public irrigation schemes is relatively well understood, since it relies overwhelmingly on national government loans and subsidy (including guarantees for external borrowings) plus support from international agencies for some of the more prominent projects. From agencies, lending by the World Bank and other multilaterals for irrigation declined from a peak in the mid-1980s of approx. USD 3 bn. to approx. USD 2 bn by the late 1990s. There are now signs of a revival in this lending. The earlier trend was partly a reflection of the worldwide decline in investment in new irrigation schemes, a recognition of the need to reform institutions to make investments viable and also a response to growing hostility towards the construction of new hydraulic infrastructure of all kinds. National government loans and subsidies for this purpose have also been trending downwards. In some countries, e.g. India, state and municipal bonds have been issued for financing irrigation, with government guarantees.

Within irrigated farming, different types of scheme have their own distinct sources of funds. Financial sources of private irrigators are difficult to gauge with any accuracy, hence overall estimates are biased towards the public sector. While it is difficult to generalise about the private sector, commercial farmers tend to use a combination of loans from banks and other specialised credit institutions, where these are available, supplemented by their own savings and equity. Small-scale farmers and rural households are more likely to use informal credit sources and micro-finance to supplement their own inputs in cash and kind. Larger farmers are more likely to take up insurance and re-insurance against the risk of climate variability, though ways of covering small-scale, poorer, farmers are increasing.

2.3. Profitability of investment in agriculture and irrigation

Past *financial returns* on new public irrigation schemes have been poor, which is one reason why little private finance has been attracted. This conclusion needs to be qualified for investment in rehabilitation and modernization, where there are large sunk costs, and also for groundwater schemes and smaller schemes sponsored by farmers themselves. In both of these cases, higher returns are likely. The meagre profitability of large *public* schemes is due to various factors, including subsidised competition from imports, over-design, poor cost control, inefficient operation and the secular decline in the terms of trade of major crops. Moreover, inadequate consultation with farmers has led to

inappropriate design both from a physical and farming perspective. Between 1965 and 1998 the world prices of agricultural export commodities fell by 47% in real terms. For certain crops this was partly due to the growth of export surpluses from some developed countries.

In many cases, *economic* benefits differ from *financial* returns, and are often greater, taking account of distortions in output and input prices and the hidden benefits and costs of environmental, public health and other impacts. World Bank evaluations show a healthy economic return on most irrigation investments⁶ although lower than predicted. For many publicly-sponsored irrigation schemes realised (*ex post*) financial returns are low, though the effects of these schemes on employment, food security and wider regional development are difficult to reflect in standard investment appraisal or cost-benefit analysis. Much investment in irrigation remains profitable, witnessed by the large amount of private investment that still continues in this sector (see below). Public schemes, however, are more problematic: while investment in rehabilitation and remedial maintenance of existing schemes will continue to be efficient in many cases, there are some major schemes which, with the benefit of hindsight, should never have been built.

2.4. Public and private boundaries

The distinction between the public and private sectors in relation to agriculture is different from that often understood for drinking water supply. Farmers (whether smallholder or industrial) are quintessentially private sector players who often provide water through their own efforts and finance.

Certain aspects of water management are nevertheless more appropriately done by public agencies. Where an activity has positive externalities (e.g. watershed management) or reduces negative externalities (e.g. pollution control) there is a potential case for public subsidy. Certain of the overheads of water management (e.g. research, administration, monitoring, field advice) are also natural public responsibilities. There is also a category of “public goods” (e.g. flood control) that normally fall to governments because it is not possible for private agents to recover their costs, since potential beneficiaries cannot be excluded from the services. In other cases, notably the construction and operation of large dams and irrigation command systems, Governments have taken the lead and remain dominant as service providers, with high levels of subsidy, due to the large scale of these projects and their wide social and economic ramifications.

Despite this, there is a high level of private financing of irrigation. The FAO estimates that private investment fully funds 20% of the world’s irrigated area, and funds about half of the remaining 80%. In addition there are 70 mn hectares under “informal” private irrigation, including groundwater.

Public agencies dominate the supply of water to farmers in major surface irrigation schemes, but private farmers themselves provide for most of groundwater supplies. Private farmers, acting alone or in cooperatives, also frequently arrange and finance their

⁶ I Jones, Evaluation of irrigation schemes, OED, World Bank,

own investment in water infrastructure for crops, livestock, etc. with a sufficiently high value. Some public agencies are delegating the responsibility for funding and charging to farmers, e.g. through Water User Associations. There are also publicly-owned companies engaged in irrigated farming on a commercial basis, which are more akin to private investors than to parastatals.

In recent decades there has been a decline in the pattern of foreign investment by vertically-integrated multinational companies. This trend is due to various causes: the declining profitability of soft commodities because of the secular decline in their terms of trade, the reaction against the colonial associations of this kind of investment, and the nationalisation of many of the earlier projects.

In its place, multinationals have sought the higher-value parts of the production and distribution chain, e.g. high value and niche crops, processing, distribution, advisory and other specialised services. Recently there has also been a turn of the tide on the part of national governments, a number of whom have sought to divest their holdings, returning them where possible to private hands (in some cases former owners). Privatisation in this sector is now acceptable in many countries (Tanzania exemplifies the swing of the pendulum in its extreme form). There are now powerful business interests in developing countries themselves (especially in Asia and Latin America) which have taken over existing assets and developed others. Some of these companies now function at an international level.

There is a widespread willingness by private farmers and agricultural corporations to finance water infrastructure when they own and control the facilities for their own use. What is less common is the private development of infrastructure for the sale of water to farmers on an arms'-length basis. There are groundwater markets in South Asia involving sizeable investments in distribution, but their environmental sustainability is debateable. There are also examples in North Africa of private concessions for the development and sale of irrigation water. In such cases, freedom to charge an economic price is crucial. Where there are good prospects of profitability, there may be scope for using risk-sharing instruments (e.g. guarantees by public agencies) to stimulate private lending and investment.

2.5. Pricing and cost-recovery

In almost all public irrigation schemes the prices charged for water are well below full cost recovery levels and usually only a fraction even of the recurrent costs of operation and maintenance. Many farmers, large or small, pay no formal charges for their water, though they may make informal payments to obtain access to public irrigation services. In comparison, farmers outside of such schemes pay the full cost of water, eg from groundwater pumping (unless energy is subsidised). Such is the diversity of the circumstances and the sensitivity of the topic it is not possible to generalise in the matter of cost recovery. Although the principle of greater cost recovery from users is an incontestable part of sustainable financing, the pace of progress, the steps to be taken towards this, its preconditions, and the complementary elements in the reform process, will all vary from place to place.

There is no disputing that increasing the rate of cost recovery is particularly difficult in public irrigation schemes, nor that the present meagre levels of cost recovery results in a vicious cycle of build-neglect-rebuild. The question, “who is going to pay?” is unavoidable, and the sector’s finances will only improve if farmers contribute more, since public subsidies are generally declining and it is inequitable to have a few privileged farmers benefiting from highly subsidised public systems whilst their neighbours struggle to survive.

2.6. Attitudes of the international agencies

The FWA report noted a decline during the 1990s in lending for major hydraulic infrastructure by the World Bank, regional development banks and a number of bilateral agencies) This is due to various factors – institutional failings, poor project performance, a growth in environmental concerns, vocal opposition from NGOs, and greatly increased obligations for stakeholder consultation and due diligence enquiries⁷. Earlier Sector Adjustment Programmes may also have weakened the planning, absorption and delivery capacities of sector Ministries and public agencies. From the viewpoint of agencies and banks, such lending is administratively burdensome, and involves serious “reputational risk”. From the borrowers’ viewpoint, access to this source involves a cumbersome and protracted process, and some major client countries have opted to rely on their own resources.

The decline in ODA and development lending to (hydropower/multi-purpose) dams and irrigation infrastructure is paralleled by a similar trend in aid and lending to agriculture in general. This is due to various factors: weak economic and financial returns from rural development projects; the impact of declining real commodity prices; and the fashion of agencies to focus on institution-building and social infrastructure.

There are signs of a renewal of interest in major infrastructure by the international lending agencies. The World Bank’s new strategy is symptomatic of the wider change.⁸

2.7. Governance reforms needed

Half of the proposals in the FWA Report concerned reforms to the governance of the sector. Intensified agricultural water management and irrigated farming has its own set of issues and a specific reform agenda. The Panel’s general proposals for greater autonomy, transparency, professionalism, customer-orientation, financial solvency, etc. have direct relevance to reforms in irrigation and agricultural institutions that will need financial investments and recurrent funding.

The FWA report laid particular stress on the need for more direct financing of the sub-sovereign entities responsible for the actual delivery of water. In the irrigation sector this would include irrigation boards, river basin development agencies, water user

⁷ Typified by the Report of the World Commission on Dams, “Dams and Development: a new framework for decision-making”, Nov. 2000

⁸ The Bank’s strategy is contained in *Directions in Development*, and detailed operational guidance in its *Sourcebook for investment in agricultural water management*, 2005.

associations, public agro-corporations, etc. National governments would need to review and reform their institutional and financial relationships with relevant sub-sovereign bodies but the latter would also need to make strenuous efforts at reform to make themselves more credible, accountable to end-users, creditworthy and solvent.

Land tenure and other rights (e.g. to water use) are particularly important in improving access to rural finance services, e.g. credit and insurances. Farmers whose tenure or rights are customary, collective or difficult to establish in law are likely to find it harder to access formal financial products and services. Governments could improve the workings of financial markets by creating a legal framework in which the ownership or tenure security of land and water can develop. In countries where there is a prohibition on usury alternative financial institutions and practices are being developed.

Part II. Feedback from the Consultations

3. Views from the Regions

The regional consultations of the Working Group highlighted important variations in the circumstances, perceptions and needs of different regions.

3.1. *Sub-Saharan Africa*

Overview

A widespread view is that Africa is under-provided with infrastructure for water services, both for productive and domestic use. Africa's water resources are little developed, compared with their potential for irrigation, flood control and hydropower. The absence of storage and other infrastructure has its most visible result in the human tragedy following periodic droughts and floods. Investment is needed in irrigation, particularly for smallholders but also for larger schemes where appropriate, though this will not be on an "Asian" scale.

There is room for qualified optimism:

"...there are indications that the 'second generation' of water projects in Africa can be more successful than the first one. The macroeconomic climate has improved in many countries during the last 20 years, and the agricultural sector is less discriminated against through overvalued exchange rates, poor farm gate prices and other policies. Simple appropriate technology has become better known and expensive internationally designed schemes are becoming unnecessary."

Source: Ruotsi, 1999

In Africa the pendulum of opinion and agency policies seems to be swinging back towards infrastructure, which is generally welcomed by Africans. This emerging trend is partly due to growing water insecurity, and also the desire of agencies to reverse declining disbursements to this sector. Unlike the last cyclical upswing in the 1970s and 80s, the current revival will occur against a background in which IWRM is widely accepted and becoming implanted in national policies and institutions. This gives cause for hope that future investment will be more productive than previously.

A number of countries are making efforts to meet targets set in the World Summit for Sustainable Development of formulating National Integrated Water Resource Management Plans. Such plans are an essential part of creating an enabling environment to help widen the range of potentially useful financing instruments for water development, addressing both multi-use household needs and major water resource management schemes.

In the eyes of many, water is an unfashionable and unpopular sector, except amongst donors. Ministers of Finance take a sceptical and critical attitude to water investments: the case for water needs to be made more strongly in economic and financial terms. One

contrary narrative is that host governments rely on external donor funding of water, and devote scarce national resources to sectors that cannot attract external finance.

The economic environment

Some crop prices are depressed by subsidised competition from developed country exporters. This offsets much if not all the value of foreign aid to the region, and makes agriculture less attractive to finance. However, African countries benefit from preferential free access to the EU market under the Cotonou Agreement, which would be lost with general trade liberalisation - a particular concern to sugar producers. At a national scale, food security, cheap food and self-sufficiency may be incompatible goals: it is rational for countries to get access to imports through cash crop exports, provided there is good internal storage and distribution, and farmers should always have adequate incentives to market their crops.

In Africa water for agriculture is intertwined with hydropower and multi-purpose projects, water resource development, environmental & habitat protection, flood control, rural water & sanitation, health, etc. On top of this, water in most countries has a transboundary dimension too. From a financing viewpoint, recognising the many facets of water opens up the possibility of cross-funding from other sub-sectors. Hydropower is an obvious source of cross-subsidy, and this sector has a good future in Africa, though an earlier generation of single-purpose hydro schemes will have to modify their operating protocols if they are to benefit other sectors. Thinking “out of the box” is particularly important for categories of spending that are difficult to finance from non-governmental sources, e.g. research, data collection, policy & planning, sector administrative overheads, etc.

The value of external grants as a constituent of local schemes (e.g. providing seed capital) was recognised. However, it was also recalled that routine use of subsidies in credit and microfinance scheme is unsustainable, and leads to the rapid seize-up of “revolving” funds. The distribution of heavily subsidised equipment and inputs (e.g. pumps) is wasteful and the items are frequently underused. Conventional wisdom on subsidies is that they should be Targeted, Transparent and Tapering. “Smart” subsidies should leverage other sources of finance, so that their final impact is a multiple of their own value (other sources of “finance” could equally well be in kind, e.g. labour). Water provided for certain purposes could be thought of as a public good, and its funding by grants justified in the same terms. Subsidies (and, conversely, taxes) can serve to correct market failures

A new Social Compact may be emerging between government, civil society and business, which gives greater space for the private sector in service delivery. On this model, Governments become facilitators, involving themselves less in direct production and delivery. NGOs and other elements of civil society should become less confrontational and more inclined to participate with governments and the private sector. For their part, businesses are now more open to the message of Corporate Social Responsibility, and more willing to enter into partnerships with other parts of society.

Financing projects

Compared with Asia, Africa has less large-scale irrigation and groundwater is relatively under-developed. In Africa formal irrigation appears to be very costly, while decentralised and less formal schemes are very much cheaper per unit area. It is likely that future development will include a variety of projects – some new large-scale schemes, some major rehabilitation of earlier ill-designed and poorly maintained schemes, and the development of small groundwater schemes that have been so successful in south Asia. The last type will call for a model of private finance from a variety of sources.

Water for agriculture needs more than hydraulic infrastructure. Equipment (e.g. pumps), other kinds of technology, and software are also important, and imply a totally different financing mode. Broadening the argument, funding rural roads is also likely to be vital to get supplies and produce to and from farmers, and in this context there is much to be said for government support for the spread of cell-phones (e.g. through generous terms for licences). Funding seasonal and recurrent costs is vital, to avoid past mistakes of under-funding essential maintenance and periodic replacement. More funding of project preparation would help to overcome the thin pipeline of good water projects, a common complaint by agencies and lenders.

There is a pressing need for the financing of water both for small farmers and for multiple uses by households. The “Water for Life” Decade should build on the lessons of past international water initiatives and include the productive use of water, avoiding an exclusive focus on the provision of drinking water. The evident need in Africa is to provide water for agricultural and other income-generating activities. This is recognised in the movement for Household Multiple Water Use. The amount of water provided to poor households with access to land needs to be sufficient for food & cash crop production, livestock rearing, or other income-generating purposes. Projects like this have a strong impact on poverty reduction and gender equity, especially where women are effectively lone farmers. This has implications for the design of rural water programmes. It also implies that the ability to pay for “productive” water will be greater than if it were only supplied for household drinking and sanitation.

There are many examples of localised schemes successfully getting people onto the ladder out of poverty. Many of these are organised by NGOs and not-for-profit companies. All these schemes face a “glass ceiling” in their efforts to scale up and be replicable. They typically depend on the qualities of individuals, or favourable local conditions, which are hard to reproduce on a larger scale. Often they involve the provision of seed capital, equity or reserve funds from grants (donors, NGOs) which may not be available in larger amounts. Typically they require community mobilisation and capacity building. Appropriate water technologies tend to have strong economies of scale in production and distribution, and problems of funding the initial overhead cost of market development. There is a specific problem for donors and governments of how to channel bulk finance into local initiatives, without smothering them.

Microfinance for agriculture has made relatively little headway in East Africa. It is available to small farmers’ clubs in Malawi, with collective guarantees. In Malawi (and

elsewhere) farm credit is underpinned by stop orders which enable repayments to be made out of payments by marketing boards. There has also been little progress in “term lending” (medium/long term) by commercial banks, especially to smaller farmers, in part due to previous bad experiences.

3.2 Asia

Overview

Asia has made great strides in reducing poverty and food insecurity, though its rapid population growth does not justify any complacency about the future. Urbanisation is increasing and agriculture is declining in relative importance, though its role is crucial in increasing economy-wide productivity, and it acts as a vital social safety net. Consumer food demand is changing and diversifying, and agricultural trade – both national and international – is increasingly important. Individual farms and specific regions are becoming more specialised, and farming is becoming more commercial in order to supply food to growing urban populations.

The above trends imply that irrigation needs to become more flexible and reliable. Surface water and groundwater need to be managed conjunctively and better incentives are needed for individual irrigators to manage water more carefully. South Asia contains some of the world’s largest command area schemes, many of which need major rehabilitation and adaptation. Cost recovery from users on these schemes is insufficient even to cover O & M costs, let alone asset replenishment.

Some countries (India being a notable case) have achieved food security through heavy reliance on private groundwater development, financed by official credit agencies and banks, and encouraged by heavy subsidies on the price of electricity used by pumps. This has led to serious local depletion of aquifers.

Some countries reported difficulties in producing new National Water Policies/Laws. Sri Lanka has been trying since 2000 to produce a new National Water Policy. This has been very controversial, and widely perceived as being anti-farmer (e.g. its proposals for water transfer out of agriculture). The process has lacked transparency. In contrast, in Thailand, a draft Water Law produced 10 years ago has been rejected despite extensive and exemplary public consultation. Full public consultation, though desirable, does not seem to guarantee successful reform.

Some argued that farmers carry a burden of negative perceptions: they are misunderstood, ignored or despised by officialdom, banks and lending agencies, and receive insufficient respect for the difficult conditions in which they operate. This attitude may have its roots in the supremacy of urban elites and a tendency to patronise rural “peasants”. It may be reinforced by practical factors such as transport and communication difficulties in reaching remote areas (though these are being overcome by the spread of computers and mobile phones). Also, bureaucratic controls over banks leaves them no incentive to lend to “difficult” and unprofitable rural customers.

The economic environment

Farmers operate in a highly distorted economic environment. This is relevant to discussions of the subsidy on irrigation water. Farmers often sell their output at low controlled prices, particularly in countries with a “cheap food” policy. Farmers are squeezed in various ways by policymakers with an alleged “urban bias”. Where the national exchange rate is overvalued, the income farmers get from exports is artificially depressed, but so is the cost of their imported inputs (fuel, machinery, fertilizer, etc). They may also face competition from countries which subsidize their farmers and dump farm exports. Raising the price of irrigation water could induce farmers to obtain more water from groundwater sources, which (notably in India) is highly subsidised through free electricity for pumps and which is widely contributing to aquifer depletion.

Irrigation charges at a level necessary to cover O&M costs tend to be too low to affect farmer’s behaviour and are useless as a tool of water conservation. On the other hand, if charges were raised to a range that would affect farmer’s behaviour, this would be so high as to be politically unacceptable. This conclusion, based on a review of many empirical studies, is relevant where charges can be related to farmers’ actual water use, which is probably true in only a minority of cases.

Water user associations (WUAs) don’t have critical mass or enough financial autonomy. Although WUAs are quite widespread in Asia, few of them have real power or the necessary financial prowess. In some countries revenues from the water charges that WUAs collect from their members are shared with government agencies or returned fully to governments. In one country 50% of the funds are placed in Trusts. Typical is the case of the 1987 Irrigation Service Fee introduced in Indonesia, which failed because the fund was not earmarked for spending in the irrigation districts, and was therefore perceived as a tax. In some countries revenue allocation between central and state/local governments is written into the constitution, and is hard to change.

Financing

The topic needs to be broken down by relevant categories in order to avoid wildly inaccurate generalisations. Large hydraulic infrastructure and major irrigation works are still undertaken and financed overwhelmingly by government agencies. However, at the point where bulk distribution ends there is scope for other means of financing (the “last mile” issue). Small (“peasant”) farmers producing mainly for their own subsistence finance themselves through in-kind efforts, mutual cooperation, funeral associations (in Sri Lanka) loans from money-lenders, and – where they exist – microfinance schemes. Microfinance, often run by NGOs, is frequently successful, but usually requires initial seed capital, and is difficult to “scale up”. The use of collective guarantees (as in the well-known case of the Grameen Bank) is rare.

Larger farmers and those producing for the market have access to commercial banks and official lending agencies. The importance of these formal sector lenders differs between countries, and also depends on the size and creditworthiness of borrowers. Governments often regulate banks’ farm lending, e.g. by imposing low interest rate ceilings. This may be combined, as in India, with requirements for banks to lend a minimum % of their

portfolio to agriculture. Banks' farm lending tends to be both highly bureaucratic (detailed controls over the amount of credit appropriate in particular cases) and highly politicised (cancellation of farm debt before Elections, arm-twisting of banks to achieve lending targets, government underwriting of farming loans). Even so, in India at least, private commercial banks see agriculture as a lucrative growth market, but they are usually thinking of farmers selling on a commercial scale in export or urban markets, or agro-processors. Suppliers of seed, fertiliser and other farm requisites are also likely to offer credit to their clients. However, all the above applies only to short term credit. Medium and long term lending to farmers – say more than 1 year – is still rare even to creditworthy borrowers.

Money-lenders are widely denigrated and their rates invariably described as “extortionate”. However, they are widely used, often as the first recourse of poor farmers. They provide an approachable, flexible and personal service to borrowers who represent a high risk to conventional banks and often lack the collateral security the latter usually require (including formal legal tenure to their land).

It is claimed that state lending institutions and commercial banks don't offer the right products to farmers – there is a gap in their product range. This usually means that they don't offer term loans longer than what can be repaid within a season (though loans for the purchase of small pumps can usually be paid off in a very short period).

There are signs that the international lending agencies are resuming their support for major infrastructure projects, though the heavy investment programmes of China and India are being funded mainly from national sources.

Farming is often a social safety net, which in some countries is increasingly the domain of women and old people, while able-bodied menfolk try their luck in urban labour markets and remit incomes. This “feminisation” of agriculture calls for extension and lending agencies to adjust their policies and approach. Women have different needs, but tend to be better at negotiation with lenders, and have a better repayment record, compared to men. Moreover, men may divert loans for their own purposes. Some microfinance schemes specifically target women farmers.

The environmental services provided by water (e.g. recreational use of reservoirs), can be monetised and converted to revenue for the water sector. Multipurpose projects (e.g. hydropower, flood control) can cross-subsidize agricultural water use. Moreover, water can be sold to pay for water. Surplus agricultural water, or its wastewater run-off, can be sold to other sectors on a seasonal or permanent basis and the proceeds reinvested in developing the water sector. In Inner Mongolia a new coal power plant bought water from an irrigation district. In Sri Lanka, a village has won compensation for the diversion of water for urban use from its traditional tank.

Several Indian states have raised finance for irrigation by issuing bonds. However, they tend to carry a high rate of interest, and there is little prospect of recovering debt service from irrigation charges. Hence bonds are only a sustainable solution in states that are willing to cross-subsidise agriculture from general revenues. Sub-sovereign financing of agriculture is rare in Asia, and usually requires a sovereign guarantee.

3.3 Middle East & North Africa

Overview

Throughout this region irrigation is the backbone of agriculture, and is projected to supply 60% of the region's food needs by 2030. Despite this, agriculture makes up a declining share of GDP and employment in most countries, and nearly all countries have an agricultural trade deficit.

Individual farms and regions are becoming more specialised in response to growing urbanisation and export demand. The region's investment priorities are to improve water productivity, and to modernise and upgrade existing schemes to make them more flexible in response to changes in farmers' demands. Other priorities are to improve water productivity under rainfed conditions (e.g. combining water harvesting with supplementary irrigation), treating and reusing wastewater for irrigation, and using brackish water. Complementary institutional reforms would be required, especially the improvement of irrigation services and capacity development for all stakeholders.

Global drivers affecting water for agriculture provide great uncertainty for policymakers. These include population growth, rising per capita incomes, and the resulting changes in diets and life-styles. If countries such as India started consuming meat on a large scale this would have major repercussions, e.g. the increased cultivation of fodder at the expense of food grains. If large countries (China, India, etc.) reached a "tipping point" where they became big food importers, this would have an impact on prices, which would affect other food importing regions such as the Middle East & North Africa and sub-Saharan Africa. Current international trade negotiations may result in a reduction in subsidies (which have reached massive levels in the USA) and other trade distortions.

Among positive trends noted are the development of simple and appropriate irrigation technology, the involvement of stakeholders and beneficiaries in the design and implementation of new schemes, greater realism in the design of new projects, improved government capacity, and greater acceptance of the potential role of NGOs and the private sector.

Investment priorities & financing sources

Financing the expansion, upkeep and modernisation of the infrastructure for water storage, transport, distribution and drainage is a perennial concern. Competition for scarce water between agriculture and other sectors lends an urgency to the search for more efficient water use and use of the various methods of demand management. Raising more funds from user charges, and transferring more responsibility to water users themselves, are active issues, which have produced a variety of institutional responses. There are also some interesting examples of private sector participation in surface irrigation. As in the other regions, there is also a need for financing water supply for

villages, communities and households for livelihoods and food security (access to “productive”, multiple-use, as well as potable water).

The region’s investment priorities are to: improve water productivity; modernise and upgrade existing schemes and make them more flexible in response to changing farmer demands; improve water productivity under rainfed conditions (e.g. combining water harvesting with supplementary irrigation); treating and reusing wastewater for irrigation; using brackish water; improving irrigation services and capacity development of stakeholders.

Governance reforms in this sector are essential. Reversing the current declining trend of investment in irrigated farming calls for reforms to the enabling environment, and the use of public investment to support, rather than supplant, private initiatives.

External aid remains important. The finance of irrigation from international donors and agencies has declined since its peak in the mid-1980s due to high construction costs, poor performance, falling real crop prices, competition for scarce water, adverse environmental impacts, etc. However, most countries without major oil revenues have weak public finances and rely heavily on concessional funds for investment in the water sector, especially from the main agencies active in the region (viz. UN, World Bank, Islamic Development Bank, Kuwait Fund, Arab Development Fund, EU and Japan).

After sinking to a low point of \$200 million in FY2001 and again in 2003, the World Bank’s lending for agricultural water management has resumed an upward trend (to an estimated outturn of over \$1000 mn. in 2005)⁹. Two recent cases of public-private partnership in irrigation have been concluded, both using groundwater for growing export cash crops. These are the Desert Road project in the Western Delta, Egypt and the Guerdane scheme in Morocco.

Water pricing in agriculture is making slow headway. In practice, tariffs cover less than O&M costs, except in groundwater. Crucially, revenues collected tend not to be retained in the sector, which reduces farmers’ incentives to pay. The region has plenty of experience in water user associations (WUAs) and irrigation management transfer (IMT), but less than 10% of the irrigated area is affected and only 10% of WUAs are functioning well (WUAs in small scale projects in Tunisia are notably good).

⁹ The Bank’s strategy is set out in its paper *Directions in Development*, and detailed guidance is contained in its Sourcebook for Investment in Agricultural Water Management (*Shaping the future of water for agriculture*).

4. Themes & Issues

Certain overriding themes and issues emerged from the consultations. These are discussed here under the headings of diversity & complexity, the changing social and economic roles of agriculture, market distortions, externalities and public goods, and good and bad regulation.

4.1. Diversity and complexity

Water is provided for agricultural purposes in a wide variety of situations to an equally great diversity of users. Consequently financing requirements differ greatly between different parts of this sub-sector, such as: large public command areas producing low-value staple crops using surface irrigation; groundwater irrigation from tubewells; farmer-financed schemes, based on run-of-the-river, mini dams etc.; large commercial farms and plantations selling cash crops in world markets; households carrying out “productive” activities needing water, etc.

To add further to the complexity, financing options depend on such local farming and environmental features as: balance of livestock and arable production; subsistence or commercial; local sales or export; high- or low-value crops; stand-alone farming or part of a multi-purpose scheme, etc. Options further depend on the degree of water scarcity, the size and type of structures or on-farm works, the cost and sophistication of agronomic & irrigation technology and inputs used; whether water is used for basic or supplementary/insurance purposes; feasibility of recovering costs through charges, etc.

The important point is that agriculture is not a homogeneous sector, nor are farmers of a uniform type. This limits the scope for universal proposals of the “one size fits all” type. Recognising the variety of specific situations can ensure that provision is better tailored to what users want, are able to finance, and are willing to pay for

4.2. Changing social & economic roles of agriculture

On a global scale, the relative economic importance of agriculture is declining: in most regions and countries the contribution of agriculture to national income is falling. Yet the absolute numbers of people who are dependent on agriculture is rising, since urbanisation is unable to siphon off all the growth of the rural population. The health of agriculture is vital to the employment and income of hundreds of millions of rural families, not to mention the many others who depend on their products and services.

Agricultural development has impacts on *poverty* that are not confined to the farmers directly involved. About 300 million of the world’s poor currently live in urban areas, and their interest is in access to plentiful and affordable food. Of the larger number of global poor living in rural areas (900 million), many are landless and rely on wage employment or the products and services of the local environment. Developments in the

wider agricultural sector will also affect subsistence farmers producing wholly or mainly for their own consumption through changes in markets and prices in the cash economy.

In some circumstances the alleviation of rural poverty may be more effectively done through urbanization and employment creation than by targeting water development to the rural poor. A concern for poverty also influences irrigation strategy: it has been argued that large-scale irrigation can be a prime mover in achieving national food security, but that the best way of improving the livelihoods of small farmers may be by promoting low-cost, market-driven micro-irrigation¹⁰.

Urbanisation changes the economic and social environment of agriculture. On the one hand it creates a growing demand for crops and products produced on a commercial scale and to the standards expected by a sophisticated urban market. This is increasingly the domain of highly capitalised and commercially-oriented farmers, well able to afford the necessary water infrastructure. But there is another side to urbanisation, where workers (usually male) migrate to the cities in search of jobs, leaving their dependent families behind on farms to survive on remittances, supplemented by subsistence farming. Farming is a social safety net, sustaining dependent families and eventually returning urban workers too, in their retirement, sickness¹¹ or unemployment.

The *feminisation* of agriculture is one symptom of the above. In the absence of male workers, women become *de facto* heads of household and chief farmers. Depending on their situation they may concentrate on mixed subsistence production for their families, or they may earn cash from the sale of more specialised products. Women farmers tend to have different needs and working modalities, compared to men (for instance, pumps and equipment designed with men in mind may be difficult to operate by women, and need modification. Women also have different approaches to negotiation of finance and are typically more reliable debtors. Rural credit schemes (including microfinance) should be tailored to the specific needs and approaches of female-headed farms. A number of microcredit schemes already cater exclusively to female farmers. This discussion also has relevance to household Multiple Water Use (Box 2)

Box 2. Multiple Water Use Services

The movement for Multiple Water Use Services (MWUS) has arisen from a recognition that water provided in a “single use” scheme is in practice used for many purposes by households, some of them “productive” (i.e. income-earning). This reality, which is often viewed as a “problem” by programme designers and sector managers, is actually a development opportunity.

Services to rural and peri-urban areas are often planned using service standards (x litres/head/day) based solely on estimated needs for in-house drinking and sanitation purposes. Households that need water for other purposes – a common case – either have to divert water from “basic needs” consumption to these other purposes, or else have to sacrifice on the latter.

¹⁰ IWMI, CA, 2006, Chapter 15

¹¹ The female-headed farm is also becoming common in areas afflicted by AIDS.

MWUS is an alternative approach which:

- addresses a broad range of water needs;
- avoids illegal uses, damage & diversions because all likely uses are planned and provided for ;
- improves ability to pay for water because it is provided in usable volumes for productive activities
- allows upscaling, with low incremental costs,
- has large benefits for poverty alleviation and gender equity, since poor women are disproportionately important users of MWUS.

Planning from the outset for MWUS in rural households and communities would align water services more closely with their real needs, and improve users' ability to pay for those services.

4.3. market distortions

Raising commercial finance for agricultural water is handicapped by the presence of market distortions, such as the sub-economic level of public irrigation charges, the controls on prices of some food crops, and uncompensated social functions performed by this sector¹². In a world without these distortions capital markets would operate more freely and efficiently in allocating funds to the most profitable outlets.

Farmers operate in a market that is subject to many external influences over which they have no control and which distort the decisions they make, compared with a free market "ideal". Typically, prices of both their outputs and key inputs (land, water, fertiliser, energy, transport) are variously controlled, subsidised and taxed by national governments for social and political reasons. Some of these interventions are intended to compensate for "distortions" in international trade, such as overseas subsidies and tariffs. However, the end result is often to compound the original distortion.

Farmers often complain about the unfairness of these market distortions and the impact on their operations, though some are to their advantage. In the long term it is desirable to strive for a regime that is more reflective of market forces and which makes subsidies more explicit and targeted to social goals.

But it is unrealistic to expect an early removal of all existing barriers to the free market. Removing one distortion on its own may be ineffective and even counterproductive. This is relevant to the debate on irrigation charges, the reform of which is highly desirable for financial and operational reasons. Ideally tariff reform should form part of a package of measures to make the policy more acceptable to farmers.

Free or cheap irrigation water is often part of a national policy to keep down the price of basic foodstuffs. Unfortunately the policy can have undesirable side-effects in the wastage and inefficient use of water which is becoming more scarce and more highly prized by other sectors, including households in growing cities. *In theory, it should be possible to de-link the price of foodstuffs from the price of irrigation water, and to apply*

¹² and other reasons why financial returns are often below economic rates of return.

any public subsidies to farmers and/or consumers in ways which do not encourage the misallocation of scarce resources. It is desirable to study feasible mechanisms for doing this.

International trade is far from being a level playing field for developing countries. Barriers to trade in foodstuffs threaten food security and induce governments to follow policies of self-sufficiency which lead to an unsustainable and uneconomical use of water. As a step in the right direction *the UN should take the lead in excluding staple foodstuffs from any future cases where economic sanctions were imposed on a country.*

4.4. Externalities & public goods

Financing water for agriculture often entails externalities, both positive and negative. Creating a reservoir for storing water for irrigation could have the *positive* externality of controlling flooding downstream, as well as the *negative* effect of interrupting the flow of water to wetlands and other sensitive watery habitats. The presence of externalities has clear implications for public policy – the public good requires compensating (subsidizing) positive external effects, and penalizing |(taxing, charging) negative effects.

The issue has particular relevance to groundwater. Some aquifers are finite and non-rechargeable, others are being exploited in excess of their recharge rate. In both cases, financing new tubewells and pumps could deplete the aquifer, and raise the pumping costs of all existing users, as well as causing other kinds of local environmental stress (e.g. risk of saline intrusion which would eventually fatally contaminate the source). This is happening across large parts of South Asia and poses a challenge to governments and funding agencies, who must somehow reflect these costs and risks in a suitable policy response.

To broaden the argument, in regions where water resources are becoming scarcer, where exploitation is close to the renewable limit, it is clearly undesirable to cause, through easier access to finance, increased pressure on those water resources. Funders have to be aware of such potential external costs of their actions, which may come home to roost through diminished returns on their projects.

“Public goods” are a specific problem for financing¹³. This category includes flood control and protection, water clean-up programmes, watershed conservation, wetland restoration, collection of hydrological and climatic data, research & policymaking, etc. These services normally need to be funded from public sources, or by bundling them together with commercially lucrative services in an integrated project.

4.5. Good and bad regulation

¹³ A public good (which can be a service) is something that has benefits for the public which cannot be wholly captured by the agency providing it. The provider cannot recover costs by charging users, since no one can be excluded from using it. Hence public goods are not normally provided privately on a commercial basis.

The counterpart of market failure, discussed above, is policy failure – where government action creates or aggravates distortions, which make financing more difficult. Alternatively, the government’s failure to act in creating a suitable “enabling environment” hampers the development of local financial markets. Two pertinent examples are financial services and farm credit.

Farmers in low-income communities need secure, liquid and profitable outlets for their savings. Developing efficient local capital markets that can be used to provide local-currency financing depends on the attraction of such local savings. Financial bodies offering savings deposit accounts need to operate under the regulation and supervision of national central banks or finance ministries, with adequate prudential controls and safety nets. Institutions operating on the fringes of the formal financial sector may need to have a framework of financial supervision specially adapted to their situation. This is an example of beneficial regulation, which stimulates lending by nurturing a liquid savings base.

The opposite case is regulation introduced for good motives which becomes counter-productive. Some countries impose low legal ceilings on interest on agricultural credit, usually to curry political favour, but sometimes in the belief that this benefits small and poor farmers. These interest caps can have perverse effects. Lending to small farmers has a higher transactional cost per loan than loans to larger, established borrowers. Interest ceilings make loans to small, poorer, new customers less attractive, and give banks an incentive to shift their portfolios towards larger borrowers with low risk. Hence interest caps tend to favour larger clients. In many cases they may be evaded by the payment of bribes. There is evidence that farmers are less concerned about the size of interest rates than about ease of access, simplicity of procedures, and flexibility over timing of the finance and its repayment. These are areas in which the traditional village moneylender has strong advantages over formal banks, despite having higher interest rates.

III. A Future Agenda

In its work so far the Working Group has identified a number of key concerns and policy issues which will affect the prospects for attracting more funds into water for agriculture. Some of the concerns expressed by stakeholders are not easily resolved and others will require difficult political decisions. Further discussions are required, and on certain topics research is likely to be needed. Although some promising avenues of approach have been identified, specific proposals will need further elaboration.

The remainder of this report considers a possible agenda for action under three broad headings: the transformation and capacity building necessary to make institutions functional and creditworthy; how conventional forms of finance need to adapt; and how the specific risks of financing this sector can be addressed in order to attract innovative sources of finance.

5. Transformation: new roles for old institutions

The “supply side” of irrigation needs to reform to cope with the changing environment in which the sector operates and the new roles and functions that are expected of it. In future the scarcity of water is expected to grow and there will be increasing competition to use it between different sectors. Agriculture will have to become more efficient in its use of water. New investments in agricultural water will be different from those in the past, and there will be a variety of irrigation models.

Existing irrigation agencies and other supply-side agencies will need to change to adapt to these new demands. They also have historical legacies of failure and inefficiency to recoup. Reform programmes should be sufficiently ambitious and challenging, but also realistic, and it is naïve to expect the reform agenda to be driven exclusively by the state or existing vested interests. The reform movement needs to involve stakeholders from many walks of society, and be eclectic in its choice of pathways and models, choosing what works, even if it is not ideal.

There is a particular need to upgrade the role of Water User Associations to equip them for the devolved responsibilities they will be assuming. This calls for a major capacity building exercise.

5.1. The changing environment

The future shape of water supply for irrigation will be determined by a growing scarcity of water and competition for its use:

“Given the high degree of physical and economic water scarcity and the growing demands and competition for water from other sectors, there are fewer opportunities to expand irrigated areas. The emphasis must therefore shift to improving the productivity

of water, and access to water by poor people, within the overall framework of an integrated, holistic, approach to water resources management.”

Source: IWMI, 2003.

The next generation of investments will be different from the last, in type, scale, sponsors, and modes of finance (Box 3). There will be a variety of irrigation models. The distinction between large and small scale irrigation projects is crucial - small schemes based on shallow pumps tend to be easier to finance, and more profitable.

Box 3 Challenges for financing irrigation & drainage

- On present trends there will be **few new publicly financed irrigation schemes** involving surface water systems. This is due to: high and rising cost of new schemes; low agricultural commodity prices which depresses economic returns; environmental costs of water demand on rivers and aquifers; severe pollution from poorly managed irrigation schemes; fiscal constraints on continued public funding.
- Instead, key actions are **modernisation & rehabilitation of current systems, improved operation and management.**
- Review **roles of institutions involved in irrigation**, with continued central operation of major headwork infrastructure, with transfer of responsibilities for O&M and management of irrigation systems to organised user groups. There is scope for **cost-sharing of infrastructure improvement with farmers' organisations.**
- A system of water rights, and the development of markets for transferring them, would be an incentive to improve efficiency and could become the basis for collateral for loans. Risk mitigation in the form of insurance and forward contracts would also assist financing.
- Investment in improved drainage is badly needed, and its cost could be shared with beneficiaries

Source: Cleaver & Gonzalez, 2003

5.2. Realism in reforms

The above changes in the context of irrigation imply drastic changes and reform in agricultural water management, and in supporting financial services, as a precondition for attracting new financing. However, the difficulty of realising such reforms should never be underestimated, and the timescale for their achievement should be realistic. External models of reform are useful to stimulate thought, but will usually fail if they are used as blueprints (Box 4)

Box 4. Limits of social engineering

“...Key aspects of institutions are that they persist over time, and that change is path-dependent – where one is going is shaped by where one has been. These well established fundamentals are too often overlooked in the discussion of ‘models’, ‘best practices’, ‘lessons learnt’, ‘toolbox’, or ‘blueprint’ approaches, which suggest that generalised sets of solutions are possible, and undervalue the importance of context specificity and of process. ...

Instead of such social engineering approaches, it is more useful to think of organic analogies, in which each institution is a product of its own environment, rather than a replica of other institutions elsewhere. Its evolution may be influenced,

guided or enabled, but not forced. Thus we need approaches that are grounded in the local socio-cultural, political as well as physical environment. Change or reform tends to be slow and gradual (with a few exceptions), and is an open-ended, non-linear process with a high level of uncertainty... The processes are not set in motion and proceeding automatically, but are the outcome of human interaction; hence there is scope for learning processes and adaptation to new conditions.”

Source. IWMI Comprehensive Assessment, 2006. Chapter 15 (seen in draft)

The state is usually invoked as the agent of reform. Unfortunately for this view, the state in its many guises is often part of the problem rather than the means to its solution. Reform entails gathering a coalition of parties supporting change, who would benefit from it. This should include parties who can champion reform in the face of inevitable resistance from supporters of the *status quo*. Those whose existing interests are threatened will normally be more vocal and politically active than those who may benefit in future. Officials working in existing institutions may be the most intransigent of all the opponents of change, and indeed some of them are able to turn institutional inefficiency to their personal advantage.

5.3. Transforming irrigation agencies & water providers

Every water sector institution is the product of its own social, political, geographical and historical environment. Notwithstanding this and the perils of importing external reform models, the messages from the Consultations point to the need for more efficient, flexible and demand-responsive agencies involved in water management and delivery. This will be a precondition for greater cost-recovery from users, as well as making these agencies more credible (and creditworthy) clients for finance.

Agencies need to critically review what they are there to do (their “mission statement”) in the light of changing demands on their services, and the growth of broader concerns for poverty-reduction, environmental sustainability and other factors. As part of this, they need to define their “stakeholders”, listen to their core clientele, the farmers, and become more responsive to these various demands. This should include a willingness to take account of criticisms made and to make appropriate changes, which is the essence of accountability.

It is desirable for executive agencies to have a degree of autonomy in their operations, over personnel, finances, day-to-day operational decisions, and other matters. How much autonomy, and over what, will depend very much on national political, constitutional, legal and budgetary factors. Greater financial autonomy implies some retention of water revenues, in whole or part (for instance bank loans or bonds may be formally secured against future cash flows from these sources).

The performance of agencies should be monitored so that they can be held to account. Relevant performance targets should be chosen and performance contracts, or looser (but still explicit) understandings made between the agency and the organ of government to which it is responsible. Sanctions should be available to penalise shortcomings in performance. Peer-group pressure could be brought to bear either within the same

country (e.g. different irrigation boards) or internationally, using benchmarking indicators similar to those now available for urban water utilities.

Reforms in the *Office du Niger* (Box 5) exemplify focus on core mission, delegation of non-core functions to other partners, involvement of farmers in decision making over spending, accountability, and capacity building supported by external partners.

Box 5. Office du Niger, Mali

The *Office du Niger* was formed in 1932. The construction of the Markala Dam, completed in 1947, enabled the spread of irrigated farming across a wide area of the Central Delta of the River Niger. In 1961 the ON was nationalised. Over subsequent years its problems mounted, and reforms were discussed over a lengthy period until in 1994 the ON was radically restructured with the support of its international partners.

Prior to its reform, the ON had a monopoly in its area over: studies, construction, operation and maintenance of farm operations; recruitment and appointment of farmers; land tenure; supply of inputs, extension services, and mechanised services; rice processing, marketing and seed production. At this time, only a small part (6%) of the potential area was developed, and a quarter of that was abandoned for lack of maintenance. Cotton growing was abandoned in 1972 because of low yields, and returns on rice paddy had fallen to low levels. There was growing discontent among farmers, a high level of indebtedness, abandoned plots, and a high level of subsidies.

Reform was based on the philosophy of disengagement of the state, good governance, transparency, empowerment, and more rational use of public money. ON concentrated its functions on a limited number of core public services (mainly maintenance of major works, land and water management, advisory services, etc) which would be adequately funded. The tenurial rights of farmers were strengthened. Producers were involved in the management of fee revenues. Staffing was reduced by 70%. Other functions were transferred to private operators (e.g. marketing, threshing, credit, transport) and some facilities were leased out to private managers (seed farm, training centre, reception centre).

As a result of the reforms, in the ten years after 1994 the population in the ON area more than doubled, the irrigated area rose by 40%, paddy production increased by three quarters due to a clear increase in its profitability. Between 1982 and 2001 the rice surplus available for marketing rose by more than 5 times.

Source: Office du Niger, Mali

5.4. Empowerment of Water User Associations (WUAs)

A large and growing number of WUAs are in evidence, in all regions. They have been formed for a mixture of motives, to perform various functions. Some have arisen as part of an active process of decentralisation of service responsibility, having seen the good results possible in farmer-managed irrigation systems. Many more have been formed to help fill a vacuum caused by the decreasing ability of central irrigation services to cope with a deteriorating infrastructure and de-motivated staff. Government funding constraints are probably the main motive. Initially, WUAs tended to be small and

entrusted with tertiary level responsibilities over rehabilitation, maintenance and water distribution.

Since the 1990s the process of decentralisation has taken on new momentum in the movement for irrigation management transfer (IMT) to user associations. There is growing experience of a range of IMT cases in many different environment and an understanding that success depends on such factors as: sustained political commitment; clear water rights; rights of WUAs to raise revenue, enter into contracts and impose sanctions; compatible infrastructure; management accountability & incentives, arrangements for conflict resolution, adequate human and financial resources, etc.¹⁴ Upgrading WUAs to handle a wider range of tasks has had some success at lower levels in smaller schemes, though major capacity development is required for them to perform at higher levels of management in more complex management environments.

To conclude, delegated responsibilities need to be accompanied by sufficient delegation of powers (“voice and choice”) to enable the WUAs to function effectively in the new environment. The empowerment of WUAs needs to include:

- Recognition as legal entities, a precondition for their obtaining finance;
- Enlargement of their responsibilities to take in other functions closely related to the concerns of their members, for instance important upstream and downstream activities;
- A voice over decisions over priority setting in works, budget allocations, and setting fees and tariffs;
- collection and retention¹⁵ of revenues
- serious capacity development of WUAs to equip them for new and more onerous responsibilities.

the messages from the Consultations point to the need for more efficient, flexible and demand-responsive agencies involved in water management and delivery. This will be a precondition for greater cost-recovery from users, as well as making these agencies more credible (and creditworthy) clients for finance.

Agencies need to critically review what they are there to do (their “mission statement”) in the light of changing demands on their services, and the growth of broader concerns for poverty-reduction, environmental sustainability and other factors. As part of this, they need to define their “stakeholders”, listen to their core clientele, the farmers, and become more responsive to these various demands. This should include a willingness to take account of criticisms made and to make appropriate changes, which is the essence of accountability.

Existing irrigation agencies and other supply-side agencies will need to change to adapt to these new demands. They also have historical legacies of failure and inefficiency to recoup. Reform programmes should be sufficiently ambitious and challenging, but also realistic, and it is naïve to expect the reform agenda to be driven exclusively by the state or existing vested interests. The reform movement needs to involve stakeholders from

¹⁴ IWMI Comprehensive Assessment, Chapter 15; Vermillion, 1997.

¹⁵ Need not be 100%. The split between central irrigation services and the WUA would depend on a number of factors.

many walks of society, and be eclectic in its choice of pathways and models, choosing what works, even if it is not ideal.

There is a particular need to upgrade the role of Water User Associations to equip them for the devolved responsibilities they will be assuming. This calls for a major capacity building exercise.

5.5. Capacity building to support reforms

If serious changes and reforms are to be made in agricultural water institutions, a strong focus will be required on capacity development, including participation, empowerment, technical assistance and organisational development¹⁶. The re-education and training of staff is an important part of this. Staff exchanges, benchmarking, “south-south” cooperation, twinning, and conventional kinds of technical assistance all have a potential role to play.

¹⁶ ICID/FAO *Capacity development in irrigation and drainage*

6. Adapting conventional sources of finance

Much of the current flow of finance for investment in water for agriculture comes from governments and parastatals, donor agencies and IFIs. Recurrent costs (O&M) are covered by government subsidies and user charges. These will remain the first recourse of the sector in future.

However, future flows even at current volumes, let alone increased amounts, cannot be taken for granted without changes in the way the sector is operated. The funding sources themselves will need to review the way they work in this area in order to play their part in supporting the needed changes.

Funds are potentially available for this sector from a variety of sources, for sound projects and creditworthy users. It is not unusual for government budget allocations to be underused, and for the allocations of agencies and development finance bodies for this sector to be under-spent. Official funding needs to be used more purposefully, with better targeting. Aid donors need a better understanding of the limits of their actions; they should step back from direct provision of credit, and accept a role of facilitation and leverage. IFIs are potentially important, though the procedures for financing dams and major infrastructure needs to be re-evaluated in the post-World Commission on Dams climate of opinion.

Potentially the greatest existing source of funds is cost recovery from users. At present little or nothing is recovered from farmers for the use of water. This could change, if farmers could see some benefit from increased charges in the form of better services and local investments. This requires greater retention of revenues by local organisations, and a greater voice by farmers in spending decisions. Tariffs are a very blunt instrument for water conservation.

6.1. More effective use of government budgets

The re-evaluation could appropriately start with governments. Their budgets for this sector are often underspent, and tend to be largely spent on wages and salaries at the expense of materials and replacement items. Future spending should be more *functional* to support necessary reforms. Departments should examine the reasons for any underspending that occurs and take action to remove administrative blockages.

6.2. New Roles for Aid

External aid will continue to be needed in this sector, though on a more selective basis than in the past. Donor and lending agencies have much to learn from the past disappointing performance of agricultural projects. The following roles are appropriate for external aid:

- support for research and the collection and dissemination of information;
- facilitation rather than direct provision;
- leverage and catalysis rather than blanket funding;

- training and capacity building;
- providing initial equity & “seed” capital;
- dialogue & advice on improving the enabling environment

The tide of opinion is turning against the use of recurrent subsidies, and the introduction of cheap public money undercutting nascent local financial and product markets. Scarce grant aid should focus on purposes showing “public good” features and high externalities. Smart subsidies are required - targeted, transparent and tapering.

For project aid, donors and host governments should reflect on the hard-won lessons of experience before including credit components in agricultural projects (Box 6)

Box 6 Ten Commandments for irrigation finance in Africa:

1. correctly identify the farmers’ real principal problems; do not short-circuit the participatory process; adopt the least complex technical solution.
2. credit is not always, or even in a majority of cases, the most appropriate solution. The outright sale for cash of inexpensive equipment may be preferable to setting up troublesome credit programmes; identify potential local manufacturers & retailers
3. If credit is necessary, ensure enough long-term funds are available; avoid loan guarantee schemes.
4. Care over procurement: ensure appropriate & cost-effective techniques, sufficient technical back-up, prefer incremental improvements to radical change, generally prefer micro-irrigation where local hydrology permits.
5. rely more on decentralised financial systems rather than formal banks (though latter have role as financial wholesalers). Prefer use of local savings & credit and avoid too much easy money from external sources.
6. do not undermine local financial markets by including a cheap credit window into the project, which is usually unsustainable and causes local damage
7. farmers must be required to self-fund increasing proportions of their irrigation projects by properly depreciating their fixed assets.
8. learning and dissemination should be built into projects, on both donor and recipient sides (e.g. networking, study tours, twinning)
9. avoid technology-driven bias, re-orient approach towards market creation & institutional development; incorporate upstream manufacture & distribution of equipment and inputs, and give proper attention to systems for marketing output.
10. a good management information system is essential to any credit programme.

Source: Aeschliman, FAO, 2001

6.3. IFI lending

After a decade and a half of decline and stagnation, the trend of IFI lending for agricultural water management has finally turned upward. The World Bank’s lending for irrigation and drainage (I&D) is symptomatic of the change: from a low point of US\$ 200 million in FY2001 it has risen to over US\$1 billion in FY2005. Over the last ten years most of the World Bank’s I&D lending has been in Asia., and there is clearly a need to focus much more effort on Africa, where the improvement of irrigated agriculture will have a clear effect on poverty reduction. The continued growth of IFI lending to this sub-sector will depend on tackling the disappointing record of irrigation in the Africa region and targeting its specific future needs.

In this context, a recent evaluation¹⁷ of the performance of IFI-funded irrigation projects in Africa offers useful pointers. The aim of the study was to determine whether irrigation costs were higher in Sub-Saharan Africa than in other regions, the factors influencing costs and performance, and ways of reducing irrigation costs in the region. It was found that unit cost/ha was much higher in SSA than elsewhere, both for new construction and rehabilitation. SSA also contained the lowest proportion of “successful” projects, defined by threshold economic rates of return, than other regions. These results were affected by the very high cost of failed projects, which were relatively more numerous in SSA. In general, big projects were more successful than smaller ones, but too much “project complexity” tended to reduce performance. Farmer-managed irrigation systems, and those producing high-value crops, performed well.

IFIs are re-positioning themselves for lending for the improvement and modernisation of existing irrigation systems, rather than creating new ones. Experience in this new style of operation is so far limited:

“Irrigation modernisation has so far produced disappointing results. With most of the world’s irrigation already developed, and with very high costs for new development, the challenge is to get more out of existing systems. The scope is enormous for efficiency gains in large-scale irrigation. Irrigation efficiencies worldwide are well below technical maxima, water-efficient technology is used on only a small area, and intensification and diversification are happening but slowly. Yet ‘irrigation modernisation’ has been disappointing: a recent study could not find a single example of a successful modernisation package in a World Bank-financed irrigation project”¹⁸

Certain general guidelines can be offered for assisting the modernisation of irrigation systems (Box 7). Although this is likely to be the largest component of IFI lending for water management, there are also major financing needs for groundwater development, drainage and water quality management, rainfed agriculture and multi-purpose operations.

Box 7. Irrigation modernisation: goals and guidance

- the goal is to improve water use and farmer incomes, thus creating a virtuous circle
- irrigation modernisation has to focus on delivering cost-effective service to farmers
- integrated investments stand the best chance of success
- physical systems may need to be adapted
- users have to be partners in modernisation programmes
- many investments can contribute to on-farm water saving-but in the end it will only happen if the farmers themselves are both motivated and enabled
- complementary investment in market development may be needed.
- Irrigation investment, combined with other factors, should bring more income for less water
- Care is needed to ensure a pro-poor element in modernisation investments, because a purely market-driven approach will favour the better-off.

¹⁷ *Analysis of Unit Costs and Performance of 314 Irrigation Projects of the World Bank, AfDB and IFAD completed between 1963 and 2003*, by A. Inocencio et al., 2005, IWMI & World Bank.

¹⁸ World Bank *Sourcebook for investment in agricultural water management*, p. 101-102

Source: World Bank Sourcebook, Chapter 3.

It has already been noted (section 2.6) that one of the main reasons for the decline of IFI lending to this sector has been the rise of environmental and other concerns about the impact of major infrastructural projects such as dams and water transfers, which have led to the production of new procedural guidelines for new operations of this type¹⁹. The appraisal, planning and implementation of dams and other major works now has to conform with much more comprehensive and rigorous standards, involving a wider range of stakeholders, and more lengthy consultation, than previously. Projects that emerge from this process are likely to be more sustainable and acceptable than an earlier generation of schemes. However, there is a risk that “the best is the enemy of the good” insofar as lending agencies, banks and private investors are deterred from lending by “reputational risk”, and that borrowing countries despair of the delays and uncertainties imposed by the new procedures, and either go it alone without IFI support, or fail to implement urgently-needed projects²⁰.

In order to secure finance for essential major infrastructure from IFIs and commercial lenders, some *modus vivendi* will need to be struck which preserves the key elements of the WCD *desiderata* but which avoids delays and complex procedures which deter both financiers and borrowers. With this end in view, we recommend study of the experience of dams and other major hydraulic projects concluded since 2000 with IFI involvement.

6.4. Cost recovery from users.

Water users are potentially a very large source of finance for infrastructure, through water charges. These revenues are important both to raise essential funds for the operation and maintenance of systems, and also because they turn passive recipients of water into paying customers, potentially with an important voice in how services are provided.

Recently the case for raising irrigation charges, which is strong, has been clouded by a controversy over how far tariffs can influence farmer’s use of water. Irrigation charges can have dual objectives, raising funds for the sector and giving incentives for more careful water use where it is scarce. While the former is not in question, the use of charges to alter farmers’ behaviour is more problematic²¹: charges would need to be very much higher than at present, which would run into stiff resistance. There would also have to be some credible system of measuring water use and an effective collection system. Farmers may well be more willing to pay (WTP) for a decent service than politicians are to charge them. But where service is poor, revenues are apparently wasted on such things as a swollen bureaucracy, and collectors are corrupt, WTP tends to be low.

Accepting the argument that charges may not greatly influence farmers’ use of water in no way weakens the case for recovering more costs from users to raise essential funds for

¹⁹ notably the report of the World Commission on Dams, and the more recent reports of UNEP’s Dams and Development Project.

²⁰ See the statement of the Ugandan Minister for Energy at the London Workshop, April 2004.

²¹ HR Wallingford, various reports, 2002-4. This is also a general conclusion of the Comprehensive Assessment of Water Management in Agriculture (IWMI et al).

O&M and eventually capital costs of systems. However, the timing and context of raising such charges are crucial.

Farmers are more likely to acquiesce in paying higher charges if there is a good prospect of improved service. This is unlikely where such revenues flow back to the Treasury and the irrigation agency has no control over their use. The success of a more active charging policy depends on either giving the irrigation authority financial autonomy, so that farmers would see direct benefit from higher charges, or enabling farmers' organisations to hire irrigation services on their own account. In either type of regime, farmers would be transformed into clients who "owned" the process of reform, and would be able to exert pressure on the authority to make its operations efficient in order to keep costs down.

Better cost recovery is essential, in order to provide revenues for the efficient operation of schemes and make a contribution to investment outlays. However, its success is likely to depend on the following:

- The recurrent cost of schemes should be kept as low as possible, to minimize financial burdens on users. Minimising O&M costs should be a selection criterion of projects.
- Recognition that irrigation water charges are unlikely by themselves to induce more efficient agricultural water use, unless they are raised to unrealistic levels. In any case, volumetric pricing is feasible in only a minority of cases.
- Water users need to be convinced that the financing system for irrigation is fair. The timing of payments should also recognize the seasonal cash position of farmers.
- Users are more likely to pay higher charges when they foresee that this will be linked to improvements in the quality of service. This is more likely to happen where irrigation agencies have some financial autonomy and are allowed to retain all or part of revenues, and where farmers have a voice in operational decisions.

Further study is required of cases where irrigation tariff reform has been successfully introduced, and their lessons for implementation.

7. Mitigating specific risks: the key to attracting new funding sources

7.1. Sector-specific risks

Lenders and investors in agriculture expose themselves to a variety of risks. Some of these are generic and not specific to this sector, though they may apply with greater force in agriculture than elsewhere. Some risks affect individual producers, others concern the whole sector. The main risks to note are: project profile & cash flow; production, client & credit; market; environmental; climatic; foreign exchange; sub-sovereign; political, contractual & regulatory.

These risks can be addressed and mitigated by a mixture of measures. In some cases this entails designing the project to make it more risk-proof. In other cases the provision of complementary infrastructure would reduce risk. In the realm of financial engineering the options include: structuring the project finance package; insurance, guarantees, choice of suitable loan terms, use of derivatives; adequate capitalization and liquidity of the borrower; collective security; Central Bank action to refinance illiquid loans, etc.

The following risks are important:

project profile & cash flow:

Major hydraulic infrastructure projects have lengthy periods for preparation, negotiation and construction, followed by long payback periods over which they yield their benefits. Benefits and cash flows tend to be delayed and prone to future uncertainties, while capital spending is heavy and up-front. Cost recovery from users is normally very low. Once made, investment is sunk (e.g. in dams, irrigation systems, tubewells, field preparation) and cannot be switched to other uses. Other kinds of projects have different features, with lower risk: some are very profitable, with low capital cost and a rapid payback, such as pumps for shallow tubewells.

Mitigation.

The financing structure of the project should suit the cost profile and expected cash flow, with sufficient grant/equity to provide liquidity and avoid excessive leveraging²². Debt should include long term loans to match infrastructure life. For large projects external Partial Credit Guarantees can cover risk of later debt servicings.

Production/client/credit risk.

This includes all the factors applying to individual producers that can place credit or investment at risk, such as local groundwater depletion, machinery failure, pests and diseases, livestock or crop larceny, damage from wild animals, poor farm management, illness or death, labour problems, etc.

Mitigation. There is no substitute for a careful individual credit assessment by an institution familiar with the borrower, or with local circumstances and needs. Lenders who have to operate on a large scale need to wholesale their funds through institutions geared up to operate at a sufficiently local level. Larger clients may be able to attract credit risk insurance, e.g. Partial Credit Guarantees, from public or private agencies. Smaller borrowers may form groups offering collective security, effectively guaranteeing

²² Ratio of debt to equity.

each others loans and exercising peer group pressure on each other to repay (the lending philosophy of the Grameen Bank in Bangladesh). Central banks can alleviate the bad loan problems of individual banks by ensuring adequate liquidity in the market, and facilities for refinance.

Market risks.

Short term market risks may arise from local factors interrupting the movement of crops and livestock to markets, or insufficient storage, both of which would prevent the producers hitting markets at the best times. Taking a longer view, agricultural produce is subject to both seasonal and cyclical price fluctuations, and in the longer term many commodities have suffered declines in their real prices, not foreseen at the time of investment. The advent of new low-cost producers (e.g. recently for coffee), or dumping of subsidized exports onto world markets, are other market risks.

Mitigation. Action on several fronts is called for. Individual producers should be adequately capitalized and have access to liquidity, in order to tide them over short term case flow problems. Governments and marketing authorities can provide supporting infrastructure such as farm-to-market roads, storage facilities and market intelligence to enable access to markets at the optimum times for producers.

Environmental risk. Major water infrastructure entails interference with the local environment. This can arouse opposition (as well as support) from populations affected which may delay implementation, or require costly alleviation, which creates “reputational risk” for implementing agencies and financiers. Some environmental impacts may not be properly anticipated, leading to problems later (e.g. siltation of reservoirs, cracks in bedrock, salinisation of fields). Water schemes that cause major changes in the pattern of flows, or which contaminate surface runoff or aquifer recharges, are open to legal challenges that may lead to compensation, or imposition of pollution charges. The uncontrolled spread of tubewells is likely to hasten the depletion of aquifers – all pumpers will face increased costs, and those with shallower wells may find their source dries up. Projects involving the creation of reservoirs, canals and irrigation ditches may also create the habitats for the spread of water-related disease such as bilharzia, schistosomiasis and malaria.

Mitigation. Major schemes such as dams and water transfers are now subject to extensive procedures of investigation, option appraisal, consultation and due diligence which, if properly carried out, should reduce these risks. In multipurpose hydro schemes attempts to transfer many of these risks to private partners have not been very successful and there is a sentiment in favour of retaining public ownership of key functions. There is a heavy onus on public authorities to anticipate and monitor these environmental risks.

Climatic risk. Agriculture is always at the mercy of the elements. The availability of water from reservoirs, wells and rivers is affected by weather and the longer-term climatic impacts of global warming. Climatic factors may also cause pests and diseases.

Mitigation. Provided the water source is secure, irrigation itself can help to secure producers against the effects of drought. Diversifying water sources is sensible, including the conjunctive use of ground and surface water, the use of irrigation to supplement rainfed agriculture, and the use of rainwater catchments at whatever scale is appropriate. It is also sensible to choose crops that have some resistance to climatic extremes, and include a balance between different types. Large commercial farmers may

be able to insure against weather, but this option is not feasible or available in all cases. Other exotic products have also been developed (Box 8).

Box 8. Weather derivatives in Mexico

FIRA, an agency of the Bank of Mexico, collaborates with commercial banks in the finance of irrigation investments, which include a 50% state subsidy. FIRA offers 5-7 year investment credits, stretching to 15 years for large projects, using collateral from land and water rights (which can now be bought and sold) plus machinery. FIRA offers hedging for interest rates in order to stabilize financing costs, and “weather derivatives” to offset the fall of farm incomes due to shortfalls in deliveries of irrigation water.

Foreign exchange risk. The use of loans or investment capital needing reimbursement in foreign exchange is an obvious source of risk where revenue arises in local currency.

Mitigation. Forex insurance is not normally a viable option. Maximising the use of local funds is an obvious solution, where they are available on the right terms. External agencies can assist by providing credit enhancement to local borrowers or bond issuers. MFIs can help by raising funds in local markets and using the proceeds to lend in the same currency.

Sub-sovereign risk. Central governments are increasingly reluctant to offer sovereign guarantees for the financial dealings of sub-sovereign bodies, which are often weak, politicized and financially insolvent. This creates a financial dilemma for such bodies, which have inherited service responsibilities without the necessary financial powers or creditworthiness. Investors, operators and lenders dealing with sub-sovereign bodies (e.g. irrigation agencies, Water User Associations, River Basin Organisations, state or local governments) are having to take risk on their counterpart, without recourse to national governments.

Mitigation. There is no substitute for the transformation of major sub-sovereign entities into commercially and financially autonomous bodies with powers to raise and retain revenues. Obviously this cannot happen overnight, but external agencies can advance the process by credit enhancement such as guarantees or other undertakings (e.g. EBRD’s Municipal Support Agreements) reached with sub-sovereign clients and their sponsoring institutions.

Political, regulatory & contractual risks. Generating the cash flow needed for loan servicing, debt repayment, dividends and management fees is difficult in a sector with such a high political profile as agriculture. Contracts made for water charges, power tariffs, etc, are liable to political interference. In some countries politicians are fond of cancelling farm debts, putting ceilings on interest rates and abolishing irrigation charges ahead of elections.

Mitigation. MIGA offers insurance against contractual and regulatory risk, the World Bank offers Partial Risk Guarantees, and a number of other insurers can provide cover against Breach of Contract. MFIs can involve commercial banks in *participations* (B loans) which give the banks the same preferred creditor status as that enjoyed by the MFI..

Figure 1 summarises this section.

Figure 1. Specific risks and mitigants in water for agriculture

risks	General mitigants	Financing options
Project profile & cash flow	Financing structure to match project profile & cash flow	Sufficient grant & equity; Adequate loan tenor; Partial Credit Guarantees to cover later servicings
Production, client & credit	Credit risk assessment by experienced institution; Use of local financial intermediary	Credit risk insurance (e.g. Partial Credit Guarantee); Collective security schemes; Liquidity & refinance facilities
market	Governments provide market intelligence; Investment in supporting infrastructure (e.g. access roads, storage facilities)	Adequate capitalization of borrowers
Environmental	Investigation, due diligence, consultation, option appraisal; Appropriate risk allocation & retention by public sponsor	
climatic	Diversify water sources; choice of drought-resistant crops	Weather insurance & exotic derivatives
Foreign exchange	Use local capital markets for funds	Credit enhancement of local bonds & guarantees to local bank; MFIs raise funds locally, & on-lend in local currency
Sub-sovereign	Institutional reforms to ensure financial autonomy & sound cash flow	External guarantees; Agreements with sub-sov institution & sponsor
Political, regulatory & contractual		Political risk insurance; Partial Risk Guarantees; Breach of Contract cover; Participations (B loans) to confer preferred creditor status

It is recommended that banks, IFIs and national financing agencies cooperate in the development of financial products that address the specific risks of financing water for agriculture. Convening national and regional Round Tables could be a useful start .

7.2. Co-financing solutions for infrastructure

In the future as in the past, the larger part of financing for multi-purpose dams and large irrigation and drainage schemes is likely to come from governments, supplemented by donor agencies and the MFIs. This prospect is due to the high risks of such investment, their heavy political and social overtones, a divergence between economic and financial rates of return, and the presence of “public good” features and “externalities” in such schemes. This still leaves plenty scope for involving non-traditional sources in financing

large infrastructure projects, provided the risks of such projects are properly and realistically allocated to the different parties.

The allocation of risk is particularly important for major dam projects. Many irrigation schemes depend on the construction of multi-purpose dams and reservoirs whose main revenues come from the sale of hydropower. It is therefore of some concern that hydropower projects have generally not been attractive to private investors or lenders. According to the mantra of PPP, risk should be borne by parties best able to bear and deal with it. This has been the justification for involving private investors and operators in the design, construction and operation of major capital projects. However, recent experience in the hydropower sector has cast serious doubt on this philosophy. The specific risks of this sector have proved to be difficult and expensive to handle by private partners, and have tended to gravitate back to the public sector:

“...in many cases the expected transfer of risk from the public to the private partner does not occur, and the public sector ends up assuming most of the risks it had previously carried in order to make the project bankable.”²³

For some major water infrastructure projects it may be more realistic and efficient for the public sector sponsor to retain ownership and control of the project throughout. Private financing in this case would take the form of bonds or loans backed by public or international guarantees. However, other options could be viable, as Box 9 illustrates:

Box 9 Leveraging state funding for water infrastructure

Co-financing between state and commercial banks. The Mexican FIRA (*Fideicomisos Instituidos en Relacion con la Agricultura*) offers 5-7 year investment credits in association with commercial banks, going up to 15 years for large schemes, taking collateral from land and water rights plus machinery. The state offers 50% subsidy for irrigation investments. FIRA also offers hedging for interest rates in order to stabilise financing costs, and can sell “weather derivatives” to offset unexpectedly low farm incomes due to a decline in delivered irrigation water.

State subsidy + private concession. The *Embalse Illapel* project in Chile involved a concession for the provision of irrigation services from the Illapel Dam. The Chilean state provides an initial subsidy covering a high proportion (75%) of the construction cost and a subsidy for operation in the form of a shadow tariff for storage services. The concessionaire’s responsibilities are to build the dam, which is thereafter owned by the government, and store and deliver the volume of water implied by the water rights of permanent water users in the valley. Revenues consist of direct payments from users at an inflation-indexed tariff, and the ability to sell surplus water to other buyers.

State funding + guarantees of private finance + community contributions + trust funds. The Kafue Basin in Zambia exemplifies the use of a basket of funds from all available sources. The state disburses grants to farmers through its Rural Investment Fund as part of its policy to promote food security. Government also guarantees the private funding of hydropower schemes. Costs are recovered from users through charges for the use of raw

²³ Chris Head, *Lessons from the hydropower sector*, paper in UNEP, 2004

water. Communities are expected to raise at least 20% of the required investment in kind (materials and labour) and are responsible for paying O&M costs. Other capital contributions have been made by the Mwanachingwala Conservation Fund and the NWASCO Development Trust Fund, both supported by external donor agencies. For their part, NGOs provide grants, microcredit and revolving funds to farmers in this region.

Our conclusion so far is that the financing of major hydraulic works is likely to involve co-financing by several disparate sources. Eclectic solutions are no bad thing, if they result in a more realistic apportionment of risk between the main parties – governments, banks, aid agencies & IFIs, equity investors, trust funds, private operators, farmers, civil society bodies etc. Co-financing is a means of maximising the total financing that can be obtained from a given amount of grant or subsidy.

We recommend further analysis of successful co-financing schemes with particular attention to the apportionment of risks.

7.3. Public-private partnerships (PPPs)

PPPs involve private investors or operators in some of the responsibility and risks of infrastructure development and operation, in tandem with the public sector. The simplest form is a sub-contract with a private company to provide, in return for a fee, **specific services**, which may include general management, to a public sector body that owns assets (such as a dam, or irrigation and drainage systems). This form involves little or no risk transfer, and no financing, though it may enable the public client to raise finance on more favourable terms. Another option is for a private company to acquire equity in a public corporation, going as far as a **joint-venture**, in either in an operating company, a company owning the infrastructure assets, or both.

More complex contracts could involve a private company **leasing** publicly-owned assets²⁴, in return for a rent, or being granted a **concession** to invest in and operate a system or stand-alone facility for a period of years (after which it could be transferred back to the public sector partner). The most radical option is full and permanent **divestiture** of public assets to a private investor, subject to on-going regulation of price and performance.

All these options rely on the private partner having superior expertise in developing and operating the assets in order to produce greater efficiency. Options involving the injection of new finance assume that the private partner has easier access to finance, or access on better terms than the public sector. While this may be true in some poor countries, in middle or upper income countries the government may still be able to raise money on better terms than the private partner. In such instances, the case for PPP depends on efficiency gains outweighing the higher cost of finance.

There is a long tradition of private companies and farmers developing water resources for their own use. However, the development and sale of irrigation water by private

²⁴ the French version of this is the *affermage*

companies on an arms' length²⁵ commercial basis is less common, though growing. In South Asia there is widespread private development of groundwater involving the sale of surplus water to other farmers in the area. Apart from these cases, other notable examples of PPP are listed in Box 10.

Box 10 PPP in irrigation

Service contracts (with fees charged to local client)

SAED, Senegal:

Alaoatra, Madagascar:

Nakhlet, Mauritania:

Service & management contracts (fees charged to water users)

Juazeiro, Brazil:

Toula, Niger

Peqin Kavaje, Albania

Tieshan, China

Adasiyeh, Jordan

ORMVAs, Morocco

Contracts involving commercial risk on investment (costs recovered from users)

Eastern Uttar Pradesh, India

GAP, Turkey

CSS, Senegal

Dina Farm, Egypt

Business Farms, Saudi Arabia

Toshka, Egypt

Guerdane, Morocco.

Source: presentations made at the Eighth International Seminar: "Emerging trends in Public-Private Partnerships in Irrigation Sector" of the International Network on Participatory Irrigation Management, Tarbes, France. May 2005. Papers available on website: www.inpim.org

In most of the above cases the motive for PPPs was a desire by governments to reduce the level of subsidies going to operate and maintain irrigation and drainage systems. In most of the cases, farmers were organised into groups or associations.

Projects in which private partners carry major commercial risk tend to have one or more of the following features:

- a state grant/subsidy or guarantee to capital investment;
- a subsidy/guarantee to operations (e.g. a "take or pay" contract in a BOT);
- supplementary revenue from water used for hydropower or water sold to other non-agricultural sectors;
- the use of water for profitable cash crops sold in urban or export markets

Morocco's Guerdane project (Box 11) is a rare example of a private concession in the supply of irrigation water to farmers. It exemplifies several features in the above discussion, namely: a substantial injection of state subsidy to reduce the tariff to affordable levels, the sale of high

²⁵ i.e. where seller and buyer are separate legal entities, and where the price is market-determined.

value-added produce in profitable markets, and the alleviation of specific risks in areas over which the concessionaire had little or no control.

Box 11. Guerdane project, Morocco

The Guerdane scheme has an area of 10,000 ha. And includes 670 farmers, mainly growing citrus crops with a high value-added for the export market, with high standards of cultivation and operation. Water is currently drawn from the Souss underground aquifer using private wells. This source has been over-exploited and the water table has been falling by 2.5 metres annually, and pumping is now at depths between 90 and 200 metres. Farmers have started to abandon their groves due to exhaustion of their wells or the high cost of pumping.

To remedy this problem, the Government agency concerned (PDARE) decided to allocate 45 million m³ of surface water from two dams 40 miles upstream. This is intended to satisfy half of Guerdane's irrigation needs, the remainder of the water being drawn as at present from underground sources. The project consists of the construction and operation of a 40-mile long water conduit and an irrigation network totalling 300 km.

The investment cost of the project is estimated to be US\$80 million. To finance this, a public-private partnership is envisaged. The Government will provide roughly half of this amount, split evenly between a grant and a loan on concessional terms. Farmers are expected to contribute c. 7% through one-off connection fees, and the concessionaire will provide 43% of the overall cost. Bidders were asked to tender for a 30-year concession, the sole criterion for which was the price per m³ that they would accept.

In order to admit national firms to the bidding process, some flexibility was allowed in the types and capacity of bidders allowed. In the event, two consortia submitted tenders, and the winner proposed a water tariff of 1.48 dirhams/m³. The risks to the concessionaire were mitigated in several ways:

- the high proportion of total costs that were financed through grant or soft loans enabled a tariff to be set that was affordable to farmers.
- Any loss of revenue due to a shortage of water in a particular year would be largely indemnified by the Government, with the concessionaire bearing the first 15% and farmers a similar amount through a tariff surcharge.
- The tariff is in two parts, including a fixed part payable in advance. The concessionaire may deny water to any farmer who fails to pay the advance fee.

Source: Morocco Ministry of Agriculture, Rural Development and Maritime Fisheries.:

In principle, PPP should meet less social and political resistance in agriculture than in the domestic water and sanitation sector, since it concerns the supply of a productive input, and many applications are for non-food crops, including exports. On the negative side, there is even more resistance to charging adequate water tariffs from farmers than from domestic users, hence the importance of using water for profitable cash crops.

On evidence so far,

- where preconditions are favourable PPP is an appropriate arrangement for making O&M more efficient, and keeping their costs down
- there are advantages in having a professional service organisation handling O&M functions, independent of, but accountable to, both farmers and the relevant public

- service organisation. This service organisation can be private (local or foreign), parastatal, or based on WUAs or former irrigation staff.
- Risks should be fairly allocated between the various parties to the contract. Risks placed with private partners should not be excessive or beyond their control. Risks should be kept proportional by the use of various risk-sharing instruments (capital grants, take-or-pay contracts, guarantees, etc).

We recommend a study of the experience so far with the various kinds of PPPs in irrigated farming, the scope for their further expansion, and what measures and structures should be introduced to promote these solutions to the satisfaction of the main parties involved.

7.4. Term finance for agriculture

Although farmers' needs for seasonal credit are widely catered for from a variety of sources, the situation for term finance is very different.²⁶ In developing countries there is frequently a shortage of institutions offering term finance to farmers, apart from large commercial operators such as plantations and agro-business ventures²⁷. Box 12 illustrates a situation typical of many countries.

Box 12 Commercial banks and agriculture in Zambia

The 15 commercial banks in Zambia currently²⁸ have little relevance to financing the expansion of agriculture. This is mainly due to their high requirements for collateral and exceptionally high interest spreads above inflation (35%+). Bank deposits are mainly short term, and only the most established borrowers can expect to get long-term finance.

The main driver of the high interest rates is government spending, financed by a high level of borrowing which crowds out private borrowers. At the end of 2002 Government borrowing accounted for 82% of all commercial credit extended by commercial banks and the Bank of Zambia. The rates offered by Treasury Bills and Government Bonds represent virtually risk free investments for the commercial banks, making loans to private clients, including farmers, relatively unattractive. The shortage of term finance is believed to be a major reason for the fact that less than 1% of the nation's cropland is irrigated.

Source: Zambia National Farmers' Union, September 2003.

This is a serious brake on rural development, which reflects the financial markets' view of the risks in agricultural term lending, compared to financing other sectors. These risks are of different types, and are very situation-specific. Irrigation and storage facilities may actually *reduce* a farmer's risk, while financing tree crop plantations is risky. Loans to

²⁶ Agricultural term investments have been defined as "investments in production assets used from one production cycle to another, usually over several years". Medium term finance is conventionally thought of as 1-5 years, and long-term finance more than 5 years. Term finance also includes leasing and equity. Hollinger, 2004.

²⁷ Recall the saying "bankers don't like lending to people they don't have lunch with"!

²⁸ as of September 2003. The source is "Deliberate financing of agriculture: a proposal submitted by the Zambia National Farmers Union and the Bankers Association of Zambia to the Government and the Bank of Zambia"

experienced farmers for machinery and equipment are not necessarily more risky than seasonal credit. Financing the expansion of existing activities is less risky than funding start-ups or diversification into new occupations. Successful providers of term finance tend to operate in areas with good infrastructure (including irrigation) and proximity to markets or processing companies. Box 13 includes some guidance on the promotion of term lending in this sector.

Box 13. Promoting Term Lending in agriculture

Term loans normally have lower transactions costs than shorter-term credits, but repayment schedules should be tailored to the expected cash flow of borrowers. To cover against the systemic risks inherent in agriculture term lenders need a strong equity base and access to refinance facilities and risk-sharing options. Term finance is best offered in the context of relationship banking (a long-term relationship between client and bank, including a full range of products (a “one-stop shop”). Loans should be priced according to client risk, and a flexible approach taken to collateral.

Apart from the general steps banks can take to deal with credit risk, in the agricultural context loans can be serviced through “stop orders” administered through marketing boards. Under this system banks have agreements with marketing boards under which deductions are made from payments for crops to cover interest and repayments on bank loans. This method applies mainly to cash crops with reliable markets. Under one possible variant, the largest plantation in a region, or the one operating the processing facility, could raise finance from banks which it uses to extend credit to smaller farms, recouping payments through crop purchases.²⁹

Source: Hollinger, 2004 and others.

Governments and donors could help by:

- creating the Enabling Environment
- being mindful of the impact of their own capital market operations on the cost of finance, and avoiding crowding out other borrowers.
- supporting financial institutions through assistance in the design and introduction of new financial products and technologies. This may also include the provision of long term subordinate loans or equity

Banks could consider arrangements with marketing boards and processors for the deduction of loan service payments through stop orders on crop purchases.

7.5. Microfinance

Microfinance consists of the provision of financial services to the poor in developing countries. Where it exists, it provides safe and profitable outlets for local savings, which are then lent in quantities and on terms attractive to local producers.

Microfinance is a growing phenomenon in all regions, though its true scale is hard to measure. Many commercial banks are seeking to provide wholesale funds to

²⁹ the proposal from the Zambian National Farmers Union (Box 10 and footnote 24) contains proposals for the wider use of stop orders mediated by marketing boards.

microfinance networks, and donor agencies and IFIs are offering various kinds of help, totalling \$1 billion in 2004.³⁰ Specialised trusts, networks and not-for-profit organisations also exist to mediate between bulk commercial funds and local needs for small parcels of credit.

Despite its spread into other sectors, microcredit has made limited penetration into agriculture. One reason is that many governments cap interest rates that can be charged to small farmers, which makes such loans unprofitable given the high transaction costs typical of this sector. Another reason is the lack of a sufficient density of clientele, especially those needing credit for non-farm activities. Countries where microfinance has been successful in rural areas, such as Bangladesh, Bolivia and Indonesia, have allowed “policy space” to decentralised finance, have an adequate legal and regulatory framework, and possess the necessary density of market for its services.³¹

MFIs³² have a variety of motives, clientele, and lending policies. Some prefer group credit, others lend to individuals. Some have expanded from urban markets to rural borrowers, though initially on a highly selective basis. Relatively few MFIs lend exclusively for farm activities, and most lending, even in rural areas, is for non-farm purposes.

In a rural context, microcredit overlaps with Decentralised Financial Systems (DFSs) such as credit unions, mutual/cooperative societies, village and rural banks, etc. Many of these operate on the fringes of the formal financial sector, and need an “enabling environment” distinct in certain respects from the regulations applying to commercial banks and formal financial institutions.

In the past too much money has gone from donor agencies to microcredit schemes, many of them operated by NGOs, in the form of “evergreen” subsidies. These have crowded out commercial finance and prevented microcredit schemes from becoming self-financing. Past experience is being evaluated and a consensus is starting to emerge around a few essential messages (Box 14).

Box 14 Dos and Don'ts for encouraging microcredit

- Governments should provide a sound legal and regulatory environment, including the introduction of prudential controls to protect savings.
- Governments should support to apex bodies (service organisations, federations, unions, etc) providing essential services to DFSs. These should include refinancing facilities to absorb excess liquidity and tide over individual DFS members in temporary difficulty.
- Governments and donors should be at pains to avoid unproductive competition between different donor agencies, NGOs, etc.
- Governments and donors should avoid recurrent subsidies for operations (e.g. for low-interest loans) and make sparing use of loan guarantees.

³⁰ The Economist, *The hidden wealth of the poor: a survey of microfinance*. November 5, 2005

³¹ Aeschliman, 2001, p.27.

³² Micro Finance Institutions

- Governments should support apex bodies (service organisations, federations, unions, etc) providing essential services to DFSs. These should include refinancing facilities to absorb excess liquidity and tide over individual DFS members in temporary difficulty.
- Donors should avoid providing farm credit directly through project windows which bypasses an established financial intermediary;
- Donors should re-orient their support towards capacity building, e.g. training credit officers, and avoid direct engagement in operational matters
- Donors can aid essential local infrastructure, especially for rural roads necessary for marketing produce.
- Donors and IFIs can provide financial assistance for start-up capital (e.g for office overheads and vehicles) and the training of key staff.

Public authorities and agencies have an important role in the promotion of MFIs and DFIs but this is often most usefully exercised in indirect ways, such as created an *enabling environment*. Well-meaning interventions should avoid the risk of crowding out local players and thereby suppressing the growth of local capital markets.

Governments, donors, and IFIs, with the support of international networks and other stakeholders, should convene Round Tables involving local financial services providers to consider and, where appropriate, act on, ways of promoting microfinance and DFSs for water for agriculture.

Chapter 8. Summary of key points and agenda items

The future shape of water supply for irrigation will be determined by a growing scarcity of water, competition for its use and growing concerns about its environmental impact. The next generation of investments will be different from the last, in type, scale, sponsors, and modes of finance

This sub-sector is complex, and proposals should avoid “one size fits all” solutions. Many different functions are entailed in water for agriculture – each needs to be properly funded and the various constituent parts should hang together financially.

Finance of all kinds will be conditional on supportive policies, reformed institutions, sound projects and creditworthy borrowers. In order to attract the required amount and types of funds the sector as a whole will need drastic reform.

Water institutions will need to make a strong effort for capacity development, including participation, empowerment, technical assistance and organisational development. The re-education and training of staff is an important part of this. Staff exchanges, benchmarking, “south-south” cooperation, twinning, and other kinds of technical assistance all have a potential role to play.

The trend to give Water User Associations more delegated responsibilities needs to be accompanied by sufficient delegation of powers (“voice and choice”) to enable them to function effectively in the new environment.

Future spending by national governments should be more *functional* to support necessary reforms. Departments should examine the reasons for any underspending that occurs and take action to remove administrative blockages.

External aid will continue to be needed in this sector, though on a more selective basis than in the past. Donors should be more receptive to new roles for aid, with the keynotes being facilitation, leverage and capacity building.

In order to secure finance for essential major infrastructure from IFIs and commercial lenders, working arrangements are required which preserve the key elements of the World Commission on Dams’ Report. However, these should avoid unnecessary delays and complex procedures which deter both financiers and borrowers and work against the needs of the poor. There should be a specific study of the experience of financing dams and other major hydraulic projects concluded since 2000 with IFI involvement.

Water charges to users is a grossly under-tapped source of finance with great potential, and the only sustainable source of finance for recurrent operations. However, service agencies will need to be more customer-oriented and provide a better service if this potential is to be realised. Further study is desirable of cases where irrigation tariff reform has been successfully introduced, and their lessons for implementation

The key to involving a wider range of financial sources is to identify the specific risks of this sector to investors and lenders, and to address these risks through financing structures. Co-financing from various sources is feasible, with each funder assuming appropriate parts of the risk. Further study is recommended of recent cases of PSP in this sub-sector.

Governments, donors, and IFIs, with the support of international networks and other stakeholders, should develop appropriate fora (e.g. Round Tables) involving local financial service providers to identify ways of promoting microfinance in water for agriculture. Governments should also review the impact of existing credit and capital market controls on the potential development of a microfinance market for this purpose.

It is desirable to de-link the price of foodstuffs from the price of irrigation water, and to apply any public subsidies to farmers and/or consumers in ways which do not encourage the misallocation of scarce water. Feasible mechanisms for doing this should be studied.

As a step towards assuring access to imports of essential food, and discouraging unsustainable policies of food self-sufficiency, the UN should take the lead in excluding staple foodstuffs from any future cases where economic sanctions were imposed on a country.

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Annex 2. Composition of the working group, modalities, participation & consultations

The members of the Working Group were:

- Dr. Ismael Serageldin (Chair), Director of the Bibliotheca Alexandrina, Egypt, and former Vice-President of the World Bank
- Alan Hall, Global Water Partnership, Stockholm
- Paul van Hofwegan, World Water Council, Marseilles
- Salah Dargouth, World Bank, Washington, DC
- Jean-Marc Faures, FAO, Rome
- Rudolph Cleveringa, IFAD, Rome
- Mark Giordano – IWMI, Colombo

Other co-opted members were Carlos Garces (IPTRID) and Kajetan Hetzer (SNS Asset Management NL)

James Winpenny, an independent consultant and former secretary to the Camdessus Panel acted as Secretary and Rapporteur.

Ismael Serageldin is also a member of the Gurria Task Force and through the GWP and WWC provided the link to other work on financing water.

The core WG was a compact unit, whose operations were based around a series of regional Consultations in which the views of “expert witnesses” were sought. Following preliminary meetings of the Core Working Group in Amsterdam and Washington DC, the actual Consultations were held in Hyderabad (India), Pretoria (South Africa) and Alexandria (Egypt).

The **Asia Regional Consultation** was held on October 3-5 on the campus of ICRISAT and IWMI in Hyderabad, India, with logistical support from these two organisations. Over 30 participants attended, representing the majority of countries in this region.

The meeting of the **Sub-Saharan Africa Regional Consultation** was held in Pretoria, on October 14-15, 2005, and attended by 41 participants, representing governments, parastatals, financing agencies, farmers, NGOs and others, as well as the sponsoring agencies. The meeting was organised by the GWP Southern Africa, with logistical support from the local IWMI office.

The **Middle East and North African Regional Consultation** took place in Alexandria, 23 November, 2005. The meeting was held in the Bibliotheca Alexandrina and attended by 16 participants from the sponsors, governments, and regional representatives of international agencies. Dr Ismael Serageldin was in the Chair. The meeting was organised with the assistance of the Bibliotheca.

The Consultations enabled water users, professionals, financiers and other interested parties to present their views on the issues in question. Each meeting had a specific regional flavour, although general issues were also aired. Reports of each meeting were drawn up by the secretariat and circulated to those present.

Consultations drew in a variety of parties and stakeholders, including:

- Central, state & local government officials and elected officers responsible for agriculture, water management & environmental protection;
- Ministers/officials from finance ministries & specialised agricultural funding agencies/corporations;
- Water and agricultural professionals;
- Private bankers/financiers;
- Farmers, small and large, cooperatives & Water User Associations;
- Owners/managers of agro corporations, processors, etc.;
- Spokespersons for civil society;
- Representatives of international agencies & aid donors;

The Progress Report was presented and discussed at a meeting of the Gurria Task Force on Financing Water for All, held in Paris on February 2-3, 2006 and a summary of the key points included in the Task Force Report.