

THE WORLD BANK/IFC/M.I.G.A.

# OFFICE MEMORANDUM

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TO: **Doris Köhn**, Manager MENA, Rural Development, Water and Environment  
**Jean-Claude Villiard**, Manager, MENA, Infrastructure Development  
**Inder Sud**, Country Director, Yemen Country Department  
**Salah Darghouth**, Sector Manager, MENA Water and Environment Unit  
**Jamal Saghir**, Sector Manager, MENA Urban Water and Sanitation Unit  
**Mena Water Staff, Water Resources Sector Board members**

FROM: John Briscoe, Senior Water Advisor

EXTENSION: 3-5557

SUBJECT: **Water Resources Management in Yemen – Results of a Consultation**

## Summary and Overview:

This report is the second in a series of six “country studies and consultations” which are being conducted to help prepare for the Bank’s new Water Resources Sector Strategy. The purpose of the study is to help identify Bank-wide themes so that we can serve our clients better in this important area. A major effort is going into a systematic review of our portfolio. (A draft report on the MENA water portfolio will be discussed with regional staff shortly.) But it is obviously also necessary to “get one’s hands dirty”, to get into the field and to listen to what our borrowers and stakeholders have to say. Accordingly one element of the Sector Strategy Review process is a series of six “focus country consultations and studies”. The first of these was completed in Brazil earlier this year. This note reports the findings from the Yemen focus country study which included: a detailed review of the Bank’s water portfolio in Yemen, field visits to Bank-financed projects in Sana’a, the Tehama, Taiz and Wadi Tuban, and a structured two-day consultation with about 60 partners, most from Yemen, but a few from other countries in the Region including Morocco, Tunisia, Palestine and Jordan, and a few from donor agencies.

In looking at the Bank’s work (and the borrower’s) it is easy to second guess. As some sage once said: *it is very difficult to create even the most modest work of art, and very easy to criticize the Mona Lisa!* The first draft of this report was reviewed by Bank regional managers and staff, who provided sharply critical but helpful comments, many of which have been incorporated into this revised version. But differences will remain, as is natural, in our view.

## The great water challenge in Yemen

As documented in the Yemen Department’s superb Economic and Sector Work (ESW), the problem of groundwater mining represents a fundamental threat to the well-being of the Yemeni people. In the highland plains, for example, abstraction is estimated to exceed recharge by 400%. The great challenge for Yemen is to develop institutional mechanisms which can bring water demand into line with availability, and, accordingly, the great challenge for the Bank is to help make this happen. This would be a formidable challenge in any country; it is a daunting challenge in a poor country with little institutional capacity.

Findings relevant to Bank work on water resources in Yemen:

- Yemen has been wracked by political and economic turmoil in the last decade. In this climate the Bank has, appropriately, focussed on policy dialogue and produced outstanding water-related Economic and Sector Work (ESW), and incorporating water into the Country Assistance Strategy (CAS). Given this context, it is not surprising that the current generation of projects are neither particularly ambitious nor high-performing. This is changing -- the next generation of water projects: in water resources management, irrigation, and water supply and sanitation, are much more demanding and will test both Yemen's and the Bank's capabilities.
- Only one small current project (the Taiz Pilot Project) and one project under preparation (Sana'a Basin) directly address the central problem of institutional arrangements for sustainable groundwater management.
- The Taiz Pilot Project has done a remarkable job in raising awareness about the need for new institutional arrangements, and in generating a knowledge base. But it has failed to meet its central objectives (of developing arrangements for sustainable aquifer management, and for transferring water to Taiz city) and is (dangerously) regarded as "a failure" by many in Yemen and the Bank. It has failed, in our view, for three understandable reasons. First, the project added so many bells and whistles that it lost sight of the central purpose. Second, the Bank was unwilling to deal with a discomfiting reality, namely that resolving the mining problem was only possible by dealing directly with the local elites who are responsible for over-pumping the aquifer. Instead, the Bank has embarked on an egalitarian approach which has not proved practical elsewhere, and is unlikely to be practical in Yemen. Third, and more mundanely, the project had complex implementation arrangements which were both unworkable and made the Bank a central player rather than a facilitator of Yemeni action.
- If the next phase of groundwater management in the Taiz project, and the (much more complex!) Sana'a basin project are to be at all successful, they will have to pay careful attention to these central concerns.
- There is a compelling case for the Bank to develop a groundwater management project in a (relatively) "easier" area of Yemen, where the odds are not so heavily stacked against success. A success would be very important in showing that sustainable aquifer management is possible in Yemen, and in showing how it can be achieved.
- The other Bank projects with implications for groundwater management pay little attention to these institutional problems, but focus on stimulating more widespread use of improved irrigation technology. The site visits suggested that implementation is not proceeding well in all cases, and that there must be greater attention to the implications of these technologies for aquifer (rather than farm-level) efficiency and for behavior, since farmers with more efficient technology tend to expand area, rather than save water.
- Much progress has been made in re-vitalizing the policy framework for urban water supply, in good part because there has been energetic Yemeni leadership. A corollary is that the Bank needs to help stimulate similarly-energetic Yemeni leadership in the water resources management area.
- As the urban utility reform process moves forward the Bank will have to take a broader perspective of the urban water and sanitation problem. It will not be enough to draw a ring around the city -- urban utilities will have to play an active role in improving water resources management (or they will have no water) and in ensuring that costly debts are not incurred through sophisticated wastewater treatment plants (which will bankrupt the utilities, even if they are "donated"). The Bank will also have to be active in developing innovative, low-cost mechanisms for meeting the water and sanitation needs of the poor.

Questions relevant to the Bank's Water Resources Sector Strategy

- **Are we realistic about what change is possible?** We know that water management reform ideally derives from underlying factors such as participation and a market economy. Yemen ranks near the bottom of the world ladders for these indicators. It is therefore very unlikely that the water sector in Yemen will, in the foreseeable future, look anything like an ideal water sector. In this context (and in the many similarly-unfavorable environments in which the Bank works), can we formulate achievable (but far from perfect) targets for the next five, ten, or twenty years? Are we helping our staff fend off unrealistic demands, so that the best does not become the enemy of the good?
- **Do we address the difficulty of reconciling a concern with equity, on the one hand, with the political reality of developing institutions for sustainable aquifer management, on the other?** Global experience shows that a key ingredient for sustainable aquifer management is to assign property rights to pumpers, and enlist their cooperation in restricting access and voluntarily reducing pumping. In Yemen (and elsewhere) this poses an uncomfortable choice. Acknowledging existing de facto rights means entrenching existing inequalities, but offers some chance of a politically-viable aquifer management process (with large positive externalities for all). Redistributing rights is bound to be strongly opposed by the rights-holding elites, and is almost certain to be impractical. This poses a real dilemma for an institution committed to poverty and inequality reduction, a dilemma which has not been explicitly and directly acknowledged in our work in Yemen.
- **Have we focussed enough on defining the role and developing the capacity of government capacity for water resource management.** The National Water Resources Agency is lacking in strategic vision and capacity. A key – and widely recognized -- challenge for Yemen (and its partners, including the Bank) is to help foster the technical development of NWRA. Equally important – and less widely recognized – is that NWRA will have to change its culture, so that it becomes a partner capable of catalyzing the formation of users' groups; of providing them with understandable, operational information; of helping them reach agreements on reducing abstractions; and working with them on monitoring and enforcing agreements.
- **Should we be thinking about Bank-wide, specialised teams to deal with specialised (but common) issues such as sustainable groundwater management?** The Task Team leaders for groundwater projects in Yemen have had difficulty assembling the right teams for the task. Should we be following the example of Railway Privatization, where a Bank-wide team was available for, and worked with, all regions? Are there other ways in which the Networks can be more helpful in this critical area?
- **Does our focus on portfolio quality help us improve, and does it provide a reliable basis for cross-sectoral and cross-regional comparisons?** Are we using quality enhancement processes to enhance quality (the answer is “yes” in Yemen) and are we misusing the data to make cross-sectoral and cross-regional comparisons which are numerically precise but devoid of reality?

## 1. BACKGROUND ON THE CONSULTATION AND THIS MEMO

In the fall of 2000 we will present a Water Resources Sector Strategy to the Board. As part of the preparatory work, we are undertaking a review of experience with implementation of the 1993 Water Resources Management Policy Paper. This review is being done in consultation with OED who are conducting an independent evaluation. A central element in the process is a series of consultations in six “focus countries”. These consultations are designed to get frank feedback on what the Bank is doing and how we are doing it. The first of these consultations was held in Brazil in March.

Our methodology is as follows:

- we agree with the Region on a country which will be the “focus country” for that region.
- we conduct a detailed desk review of projects under supervision;
- we make short visits to projects in the field (in the case of Yemen, to Sana’a, Zabid, the Tehama, Taiz and Wadi Tuban,).
- we speak with people from all perspectives;
- we conduct a two-day, highly structured workshop (in this case with about 60 Yemeni participants – see breakdown in Annex 1 – and regional participants from Morocco, Tunisia, Jordan and Palestine) which gives both detailed quantitative data (Annex 2 presents a summary of responses to a questionnaire on Bank performance in the water sector in Yemen.) and a lot of “color” on how the country is doing in water resources management and how the Bank is and might be helping.

After the Brasilia consultation we produced a “memo for LAC regional management”, in which we described (in unvarnished form) what we had done, what we had seen, what we had heard and

what we thought some of the implications were for our work in Brazil in particular, and for the Bank’s work on water resources more generally. This memo follows this practice, and reports the results of the second series<sup>1</sup> of project reviews, field visits and stakeholder consultation (held in Sana’a on the 12<sup>th</sup> and 13<sup>th</sup> September). (All powerpoints and documents from the Brazil and Yemen studies, are available

### **The Water Resources Sector Strategy Web Site:**

All documents and powerpoints developed in the course of the Sector Strategy are available on the Water Resources Sector Strategy Web Site. To access the site go to [www.worldbank.org](http://www.worldbank.org), click on "Topics and Sectors", "Environment", "Water Resources Management" (twice), “Water Resources Sector Strategy”.

on our web site (see box)). As in the case of the Brazil report, our hope is that this memo will be similarly useful, both for MENA management and for building the knowledge base for the Sector Strategy.

## 2. THE FOCUS OF OUR ATTENTION IN YEMEN

The Yemen “focus country study” was one element of a work program which will culminate in a Sector Strategy for the Bank on **water resources management**. While the line between water-using sectors (such as irrigation, or urban water supply) on the one hand, and water resources issues is not a black-and-white one, our focus is on the cross-cutting resource issues and not the “internal” issues of each water-using sector. (Our work thus dovetails well with sector-

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<sup>1</sup> The participants in the Yemen Focus Country Study included: Ayse Kudat from the Social Family; Keith Pitman from OED and Greg Browder and John Briscoe from the Global Water Unit.

specific strategy work, such as the Water Supply and Sanitation Sector Strategy, which will be presented to the Board in 2002 and ongoing Irrigation and Drainage Sector portfolio reviews.) Accordingly, the focus of our attention is on (a) the projects that directly address water resource management issues and (b) the elements of irrigation, urban water, and hydropower projects which are of direct relevance to water resource management.

In the Yemen portfolio there is just one project under implementation – the Taiz Pilot Project -- which deals directly with the water resources management issues. Although a small loan and a pilot project, it is one which the region has (rightly, in our view) both devoted a great deal of Bank resources to, and highlighted in fora such as Water Week. Accordingly, we looked at the Taiz Project in considerable depth. This included: detailed review of the project files; discussions with Chris Ward (who has been the project champion) and Salah Darghouth; discussions with the three Project Implementation Units in Taiz; discussions with the Yemeni social team (hired by the Bank), discussions with the Bank's former Senior Sociology Adviser (who works with the Team) and discussions with stakeholders in the field. The project was also the subject of considerable discussion in the Sana'a consultation.

We also looked at the water resources aspects and implications of other projects in the Yemen portfolio (focusing on the Sana'a Urban Water Supply Project and the Land and Water Conservation Project). Once again, this included reviews of the project files, meetings in Yemen with the Project Managers, and field visits (to the water and wastewater treatment plant in Sana'a and to sub-projects of the Land and Water Conservation Project in Wadi Zabid, Wadi Tuban and Taiz) where we met with stakeholders.

### **3. INTERACTIONS WITH BANK REGIONAL STAFF**

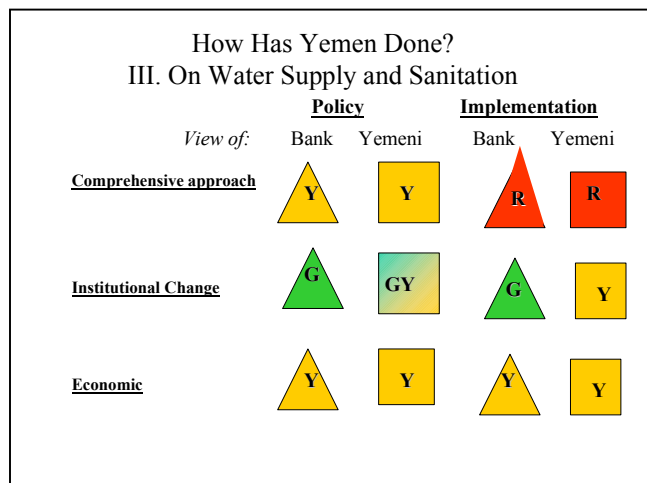
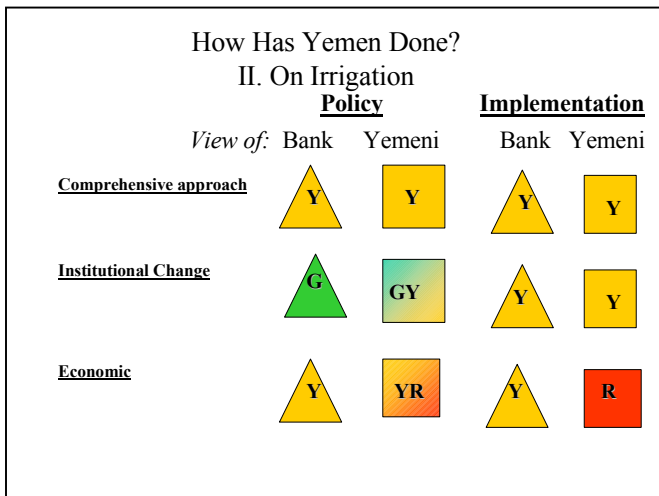
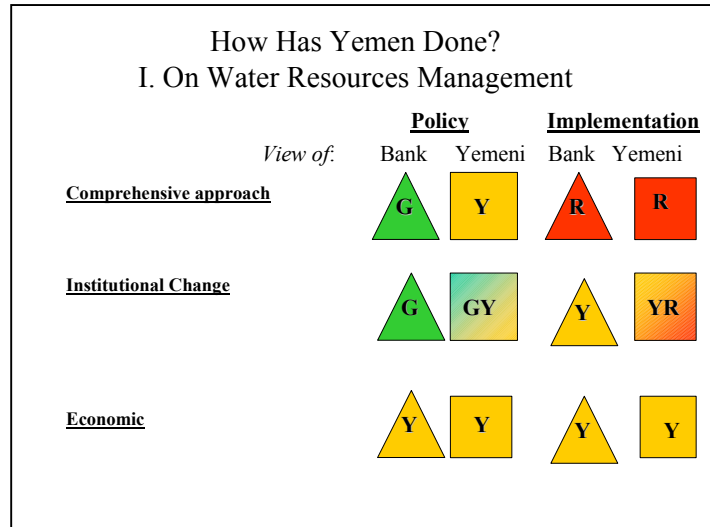
Yemen was chosen as the MENA focus country study in conjunction with Salah and his staff in the Mena Rural Development, Water and Environment Group (MNSRE). Chris Ward, the MNSRE staff person based in Sana'a helped enormously: by identifying the Yemeni professional who made the keynote presentations on "the Yemeni view" (who accompanied us on our field visits, and who did a terrific job); by helping identify the sites to be visited in our field visits; by helping identify the participants in the consultation; and by making an excellent presentation at the consultation on "the MENA region's view on the state of water resources management in Yemen" (see the powerpoint presentation on the web site). Salah and Chris participated actively in the two-day consultation in Sana'a.

The first draft of this report was sent to Salah and to Jamal Saghir, sector manager of the MENA Infrastructure Development Group. I am very grateful for the detailed comments received from the Rural Group (Salah, Chris Ward, Ashok Subramanian, Nejdet Al-Salihi, Peter Koenig, Satoru Ueda and Tijan Sallah) and the Infrastructure Group (Jamal, Alex McPhail and Josephine Masanque). In a spirit of full disclosure, the reaction from the Rural Team was, in Salah's words, "rather violent"! I have read their comments very closely and have re-written this memo as a result. I am fully aware of how easy it is to be a Monday morning quarterback. I know that there are many substantive points on which we will still disagree, but I hope that I have been more careful in phrasing this final report to regional management, so that disagreement will not be seen as disparagement of their intellectual integrity, professionalism and dedication (for which I have the highest regard).

### **4. WHAT THE STAKEHOLDERS SAID AT THE SANA'A CONSULTATION**

As in our previous consultation in Brazil, we used a "scorecard based on the Dublin principles" as a way to organize the discussion, and as a way of organizing feedback from working groups and

participants. Bank regional staff made a presentation on “the region’s views of the state of the water sector in Yemen” This was done following a pre-defined format, and indicated level of performance by a “traffic-light” method, in which green means “in good shape”, red means “in bad shape” and yellow somewhere in between. In the group discussions the Yemeni participants followed the same format, and gave their rankings of the state of the sector in Yemen. To the surprise of many, the method worked very well in Yemen (as it had earlier in Brazil) and served to actively engage the participants. The following figures summarize the perceptions of the participants, and compare the views of Bank Regional staff (the triangles) and national participants (the rectangles).

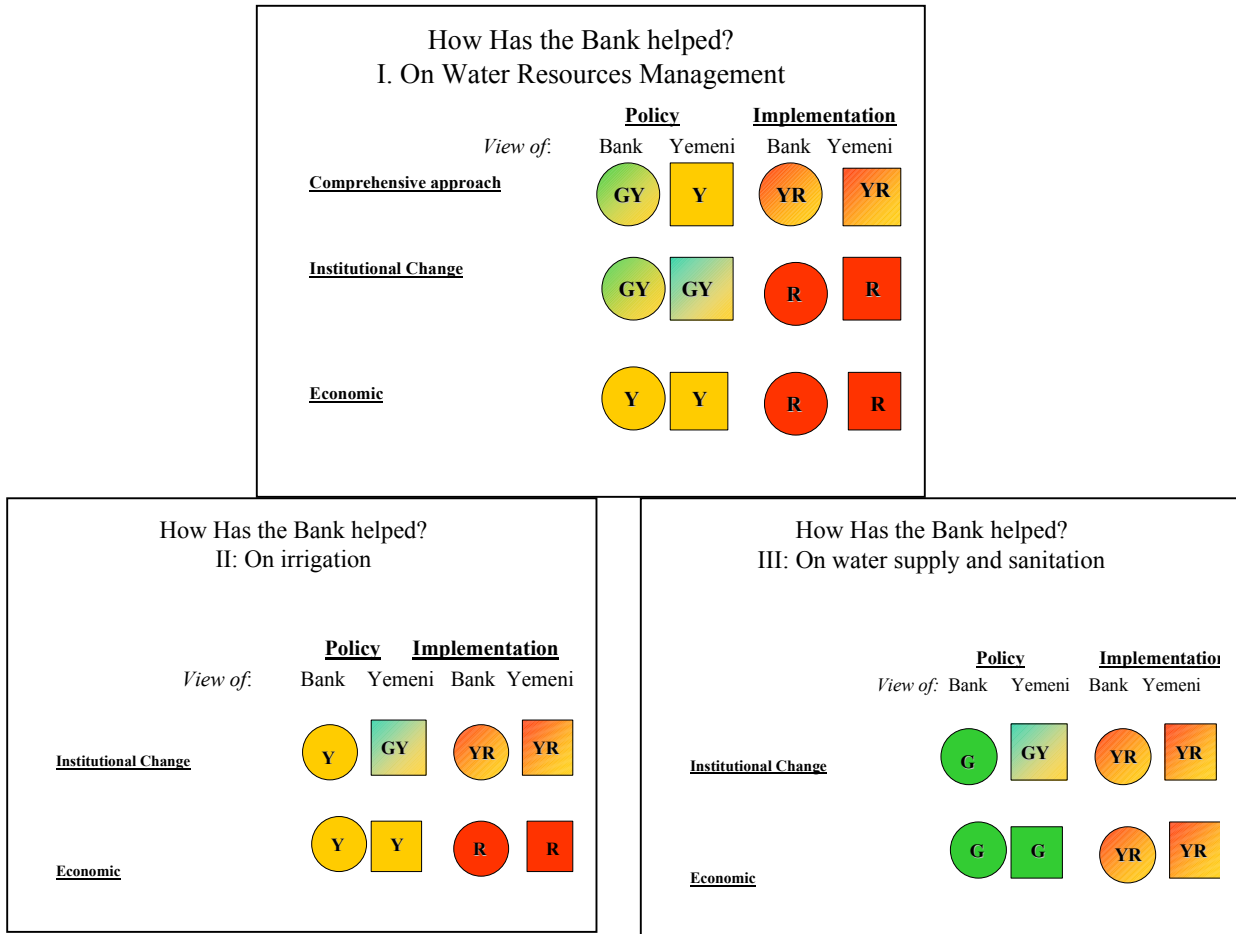


There are several broad conclusions which emerge from these figures. These include:

- Agreement that there are serious deficiencies, in all respects, in how water resources are managed in Yemen;
- Yemeni stakeholders have a more pessimistic view than Bank regional staff on the state of the water sector in Yemen;
- Agreement that there has been some progress in terms of policy, but little on implementation.

With this background on the state of the water sector in Yemen, and a discussion on the critical constraints to improved performance, the consultation focussed on the main item, namely to

assess the performance of the World Bank in the water sector in Yemen. The following figures summarize the perceptions of Bank staff from the center (the circles) and national participants (the rectangles). (The figures are drawn from the reports of six working groups. The results of individual questionnaires – summarized in Annex 2 – gave very similar overall results.)



There are several broad conclusions which can be drawn from these assessments:

- the Bank has been effective in the policy dialogue in water resources management and in water and sanitation, but less so in irrigation and drainage;
- the Bank has been much less successful in translating these principles into practice in Bank-financed projects;
- the perspectives of the Yemeni participants (both in the working groups and individually) closely match those of the Bank’s staff from the center;
- the major challenge facing Bank-financed projects is to translate ideas into action.

While these tables do throw up some interesting issues, the principal purpose was not to over-analyze these subjective data, but to use them as “a stimulus to an intelligent conversation” about the Bank’s performance in the water sector in Yemen. To get this conversation started, we asked the participants to consider the following, deliberately provocative, questions:

- Is the Bank doing the right things in Yemen – are we in the right sectors, are we dealing with the important issues, are we taking the right risks?
- Do we have the right tools and do we use them appropriately?
- Do we work appropriately with internal and external partners?

- Do we have the right people and organization?
- Do we deal effectively with the political economy of reform?

The participants were given considerable background information (see the powerpoint slides on the web site) to facilitate this discussion. Because our interpretation of these results (and our observations in the field) is heavily influenced by our judgement that groundwater management is the overriding water resource management challenge in Yemen, it is important to detour for a moment, and summarize our reading of the global lessons on groundwater management.

## **5. THE PRIMACY OF THE GROUNDWATER MANAGEMENT PROBLEM, AND GLOBAL LESSONS OF EXPERIENCE**

As documented so well in the Bank's superb ESW (especially "Local Water Management" study and "Yemen: Towards a Water Strategy"), groundwater mining in Yemen is rapidly developing into an environmental, economic and social disaster. Not only is this true in important localised areas – in the Sana'a Basin, for example, it is estimated that groundwater abstraction exceeds recharge by over 300% – but it is true on an aggregate basis for the country as a whole. I personally have never seen, at a national scale, such a mismatch between the seriousness of a water management problem, on the one hand, and the lack of institutional capacity, on the other. This should be priority item 1, 2, 3 and 4 in our work with Yemen on water – all else is secondary.

This primacy of groundwater gives rise to two fundamental questions which defined the lens through which we viewed the Bank's work on water resources in Yemen:

- (i) what are the global "lessons of experience for groundwater management"? and
- (ii) how are these lessons reflected in our groundwater-related work in Yemen?

### **5.1. The global "lessons of experience" on groundwater**

First, therefore, a short summary of the "global lessons on groundwater"<sup>2</sup>.

What characterises the problem?

- *exclusion of pumpers by physical and institutional means is costly;*
- *pumping by one person reduces water availability to others.*

What characterises the solution?

- *restricting access by potential new pumpers;*
- *creating incentives for existing pumpers to manage the resource instead of overexploiting it, usually by assigning rights to the resource;*
- *developing, among the pumpers, a shared image of how the aquifer operates and how their actions affect each other and the aquifer;*
- *ensuring that higher levels of government facilitate the involvement of users, encourage and recognise aquifer management associations, and act as partners by providing information, and helping monitor and enforce agreements.*

An important supplement to these (elegant and appropriate) "global lessons" relates to the political economy of assignment of initial rights (which is a sine qua non for getting to the sustainable regime described above). The summary of global experience with initial allocation of rights would be something like the following:

- existing water use is inevitably inequitably distributed, like wealth and land;

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<sup>2</sup> These paragraphs draw heavily on a recent paper "Sustainability: Revisiting the Commons" by Elinor Ostrom and colleagues in Science. The paper has been shared with MENA staff.

- non-voluntary redistribution of existing water use and associated rights has been proposed but not found to be practical: in developed countries such as Australia and the United States; in developing countries with strong central governments (like Mexico, where redistribution of water rights would, in the words of a prominent reformer “require a revolution”); and even in developing countries with a strong redistributive mandate (like South Africa).
- the benefits of formalizing the de facto rights of existing water users, and working with these users to sustainably manage the resource, have been judged to outweigh the drawbacks of reinforcing existing inequities

Finally, successful groundwater management has to walk on two legs. The one leg is to acknowledge rights and enlist the rights-holders in forming aquifer management associations. The second leg is a water resource management agency which provides two types of vital support to the aquifer associations. Such agencies do the (often sophisticated) technical work required to characterise the aquifers and determine their sustainable yield. Equally importantly, these agencies become partners to the aquifer associations. They provide legal and institutional support in the formation of aquifer associations; they provide understandable, user-friendly information on the consequences of different actions; and they help with the monitoring of the resource and enforcement of mutually-agreed actions.

## **6. OUR INTERPRETATION OF THE CONTRIBUTION OF THE BANK TO IMPROVING WATER RESOURCES MANAGEMENT IN YEMEN**

Against this backdrop of lessons from global experience, how is the Bank helping Yemen address this daunting challenge?

### **6.1 Best practice in terms of integration of water into the CAS, and ESW**

The Bank’s contribution to Yemen must be seen against the background of very difficult working conditions and, in particular, the turbulence surrounding the re-unification of the country. Bank efforts in recent years appropriately focussed on policy and analytic work which has laid a solid basis for an expanded lending program in water in Yemen. In this regard, what Bank staff have done and are doing on water in Yemen is best practice in the Bank. In particular: the way in which water is incorporated into the CAS is exemplary; the program of ESW on groundwater management is of exceptional quality, as is the policy dialogue (in part assisted by EDI) on water resources management and urban water sector reform. This ESW has played a fundamental role, acknowledged by all, in putting water on the front burner in Yemen and in opening the dialogue on possible solutions. Bank staff working on water in Yemen are (correctly) regarded by clients and partners alike as highly competent and committed.

In every country, even ones with much more favorable environments than Yemen’s, water sector reform is a process measured in terms of decades, not years. The progress in terms of awareness and understanding achieved (with the Bank playing a central role) in just five years is extraordinary. And it would be miraculous if there were striking progress in terms of implementation in this “blink of an eye since re-unification”. And here, on the critical battlefield of implementation, progress in Yemen in general (and in Bank-financed projects in particular) has, not surprisingly, been slow. In other contexts this pace could be tolerated, but in Yemen the inexorable march of aquifer depletion, and its profound consequences, is such that results on the ground in the short and medium term are literally, a matter of life and death.

In this environment difficult choices need to be made and difficult judgements made. The Yemen Department in general, and the water staff in particular, are extremely aware of this race

against time, and have had to make difficult decisions, balancing portfolio issues with the urgency of the reality. In the discussions on the lending program for the next three years, the Water Group had argued for a groundwater project to follow up on the Land and Water Conservation Project. The Country Management Unit decided to postpone such a project until 2003, and to focus over the next few years on straightening out the Taiz project, on completing the Land and Water Conservation Project, and moving ahead the Sana'a Water Supply and Basin projects. While the reasons behind such a decision are clear and, in many ways, compelling, in our view this discussion should be re-opened. As we argue later in this note, there is potentially very high returns from a groundwater management project in an "easy" (everything is relative!) environment in Yemen, where something could be achieved in the short term and where a success could have powerful demonstration effects.

## **6.2 Contributing to the sustainable management of groundwater**

A number of Bank projects have activities relevant to water resources management. But only one project – the small Taiz Pilot Project – has the (appropriate) aspiration of addressing THE fundamental question, namely the development of institutional arrangements for the sustainable management of groundwater. (Water resource-related components of other projects are described briefly later.)

### **(a) The Taiz project**

#### **(i) The project objectives:**

As stated by the Bank's champion for the Taiz project, the objective of the project is to develop a partnership between rural and urban users which will transfer water from country to town on equitable terms and ensure the sustainability of the resource. This is, in our view, exactly the right objective, and a critical one not only in Taiz, but throughout much of the country. For this reason, in our view, although the Taiz Pilot Project is small and experimental, it is THE most important water resources-related project in Yemen.

#### **(ii) The mechanisms for achieving these objectives**

What is the (implicit) mechanism for achieving this transfer? It is a package of rural development services to the seven thousand rural people living over the Habir aquifer, which will "compensate the people for the transfer of water to the city". The project has manifestly failed (a) either to transfer water from the country to the city and (b) to ensure sustainability of the resource. In our view the project has failed to meet these (incredibly important) objectives for three basic reasons.

#### **(iii) The critical issue of property rights to groundwater**

First and foremost, the reality is that the water from the Habir is not pumped by "the people of Habir", but by twenty-two deep wells owned by a handful of powerful people. Use for domestic purposes by the 7000 people of Habir is not quantitatively relevant – it amounts to about 4 lps<sup>3</sup> compared to the 330 lps of installed capacity for irrigation. Global experience (see the earlier discussion) shows clearly:

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<sup>3</sup> According to the "Local Water Management Study", the population of Habir is about 7,200 people. Assuming each person uses about 50 liters per day for domestic purposes, this amounts to about 4 liters per second. On the other hand, there are 22 deep irrigation wells, with an installed capacity – according to the above study, of between 10 lps and 20 lps, implying an installed capacity of between 220 and 440 lps.

- (a) that sustainability depends on “creating incentives for existing pumpers to manage the resource instead of overexploiting it, usually by assigning rights to the resource” and
- (b) that this requires formal recognition of de facto rights.

This presents a real dilemma for a development institution (the Bank) which has “reducing poverty” as its fundamental objective. The following table lays out a (simplified) set of the choices regarding the critical issue of property rights to groundwater.

Option	Probability that this will lead to sustainable aquifer management	Direct equity consequences	Indirect equity consequences
1. The “do nothing” option, which means not dealing with the issue of water rights	None	Status quo will be maintained in the short term	A “tragedy of the commons” as the aquifer dries up and the majority of the people can no longer live in the area
2. The “egalitarian” option, which would involve redistributing water rights on a more equitable basis	Nearly zero, because it will be opposed by those with de facto water rights	An apparent victory for equity	A “tragedy of the commons” as the aquifer dries up
3. The “expedient” option, which would mean recongising the current, implicit water rights held largely by the tribal elite and help negotiate a solution amongst those with these rights	Some chance of sustainable management, because there are incentives for existing users to restrict access and to limit pumping. But it will require a lot of work!	Reinforces the current, inequitable distribution of de facto rights.	Benefit to all if the aquifer can be stabilized.

**(iv) The (implicit) choices made in the Taiz Project**

Where does the Taiz Pilot Project stand in relation to this table? In the eyes of the project champion and at least some of his senior sociology advisers, the various community development activities in Habir are creating the capacity for all residents of Habir to assume rights over the aquifer and agree on the transfer of some of these to the city (Option 2, the “egalitarian option” above).

This choice is articulated clearly by the Bank’s recently-retired Senior Sociology Adviser, who is advising MENA on the project. The solution, in his mind, is to have the government of Yemen nationalize the water and distribute the rights to the people living on the aquifer. It seems very unlikely that the Government of Yemen would contemplate such an action, as suggested by the photograph showing the portrait of a (small) President and a (large) local Sheikh on the wall of a Bank-financed pumphouse in Habir. And, if the government did follow such a recommendation, there is no doubt that this would be a pyrrhic victory,



for the Bank, and (especially) for the poor. For it would mean strong resistance from those with de facto rights and a continuation of the “race to the bottom”. The aquifer would dry up, and with it, the lives of the poor (and others) in this region.

Perhaps inevitably, then, given the reality of politics in Habir and Yemen, the “egalitarian option”, is, in practice, turning out to be the “do nothing” option (Option 1). Each of the various Bank-financed rural development activities – school construction, women in development centers, community water and sanitation projects and now a (proposed) micro-credit program – are difficult to implement under the best of circumstances in Yemen. And extremely difficult given the fact that they are part of a very vague “contract” between the government “the community” for allowing the sinking of wells for the city. (It is relevant to note that the original “deal” struck by the governor was not with the community but with the local tribal leaders. In the course of the Bank project this contract has been re-defined so that it is a “contract” with “the community”.) This changing and imperfectly-specified contract has meant that virtually every activity is the subject of complex and ill-defined bargaining, with the Bank ending up as the arbitrating power! The result is that the attention of the project teams (including the Bank-funded social team) has been directed at fighting these “fires over claims”, in a hostile environment. The result is that there has been little attention to the central issue, which was to create a viable institutional mechanism for sustaining the aquifer and voluntarily transferring some water to the city.

In summary, there are two fundamental, related reasons why “the egalitarian option” will never work. First, as Mancur Olsen has shown in his seminal work, collective action becomes increasingly difficult as the heterogeneity and number of participants increases. Collective action among the handful of large irrigators in Habir is orders of magnitude more likely than it is among the diverse groups comprising the 7,200 inhabitants of Habir. Second as described in the section on global lessons, this “redistribution before assignment of rights” has never worked, even under far more promising conditions. In our judgement “the egalitarian option” is not viable and ultimately counter-productive since it is unlikely to work.

**(v) The discomfoting fact that sustainability might only be possible by reinforcing existing inequalities**

What of Option 3, the “expedient option” which may reasonably, if pejoratively, be described as the “getting into bed with the tribal leaders” option? In our judgement this is the only option which offers some chance of actually achieving the goal of sustainable aquifer management. (Not coincidentally, it was the option which the Governor of Taiz was fumbling towards when he struck the pre-Bank “deal with the sheikhs”.) It is the only option which would give those who are actually pumping the water an incentive to change their behavior.

It does, of course, carry reputational risks for the Bank, since it could be easily criticized as being “anti-poor”. But it is, in our view, the only option which has (with greatly improved and targeted technical support from NWRA) any chance of success. There would, of course, be benefits for the local elite. But it would, more importantly, be a victory for all of the people of Habir, including the poor.

Twenty years ago Habir and Al Haima were neighbouring beautiful green valleys. Today Habir is still beautiful and green, but the overpumped, barren Al Haima provides a stark picture of what Habir will soon look like if the overpumping doesn’t stop. The consequences are dreadful

for all but, as always, it will be the poor who will suffer most if there is not a pragmatic, workable solution to stop the overpumping.

**(vi) The issue of hydrogeological data**

Some of the principal actors in the Taiz project point to inadequate groundwater assessments in Habir as an important cause of project failure: *“the hydrological basis on which the water supply objective was founded proved to be flawed, (since) the wells in production are able to yield only 25 lps versus the 75 lps forecast, if the aquifer is not to be mined”*. This is an important but, we believe, mistaken concern.

It is mistaken because the Habir aquifer is that overall water tables are falling in Habir, even without any pumping by NWSA. The reality, therefore, is that it is impossible to extract ANY additional water for Taiz from Habir without further mining of the aquifer. What has apparently happened is that pumping heads on all wells have increased (because of the mining), and the yields of all wells (including the NWSA pilot wells) have declined. The stark facts, therefore, are as follows:

- existing irrigation wells in Habir, with an installed capacity of about 330 lps, are mining the aquifer
- sustainable exploitation of the aquifer will require reductions in irrigation pumping (NWRA is currently unable to estimate the sustainable yield of the aquifer and thus the magnitude of reductions required)
- any further abstraction by NWSA (be it 25 lps or 75 lps) could be done sustainably only if (a) current irrigation pumping was brought into line with sustainable yield and (b) there were further reductions in irrigation pumping to accommodate abstractions for Taiz city.

This highlights the vital role which high-quality, user-friendly and trusted decision support systems must play in management of the aquifer. Without a clear understanding of how the aquifer functions and the consequences of different pumping regimes, there can be no consensus on how to use the aquifer. Regretably NWRA has neither the data nor the skills nor the mind-set to perform this vital function. Accordingly NWRA reform and strengthening is a cornerstone for any serious attempt at groundwater management in Yemen.

**(vii) Whither the Taiz Project?**

There is a danger that the Taiz project will be written off as “a failure”. This is a worry since the Taiz project is, in our opinion, the most important project in the Bank’s water portfolio in Yemen. Its goal is to tackle a central and very difficult issue. That it is deemed to have “not succeeded” is in part because the goal is one that could not possibly be achieved in so short a time. The project has appropriately devoted a lot of effort to exploring the issues of water rights and management, and has produced some very rich analytic material on these vital themes. The project has unquestionably succeeded as a learning experience, even though many of the lessons are of the “what not to do” variety. What is absolutely essential is that the rich set of conceptual and implementation lessons from Taiz be examined objectively, and that efforts to address the central issue of groundwater management be re-doubled. In our opinion, the next steps in Taiz should be as follows:

- The multiple rural development activities should be closed, probably at the time of the project closure (about nine months from now). Priority should be given to meeting commitments, and to communicating what is being done and why.
- The new Taiz project should have two clearly-structured components. Component 1 should be to do the infrastructure and institutional work with the Taiz Water Branch (not a subject of direct relevance to our mission). Component 2 should have exactly the same objective as the

current Taiz project (namely developing institutional arrangements for the sustainable management of groundwater and, as part of this, developing mechanisms for voluntary transfer of water to the city).

- In our view the following will be critical elements in the success of such a project:
  - acknowledging that the owners of the existing twenty-two deep wells in Habir have implicit water rights;
  - working with them to ensure that no more deep wells are sunk in the aquifer;
  - get NWRA to develop clear, transparent, understandable “decision support systems” which will give the well owners an image of how the aquifer operates and how their actions affect each other and the resource. (This will include transparent information on monitoring wells, the installation of meters on the twenty-two pumps, and a clear system for linking the monitoring information to the decision-support system);
  - on this basis, develop a consensual plan on how they will adjust their pumping so that sustainability is reached; and a consensus on the payment mechanisms whereby the city will be able to negotiate that part of the sustainable yield is transferred to the city;
  - assembling a stick-with-the-project team which includes local social expertise, external expertise in administering a rights-based water management system, and external expertise in developing user-friendly groundwater management information systems.

### **(b) The Sana’a Basin Project**

Bank management deserves great credit for not walking away from the difficult-everwhere problem of groundwater management, but for embracing an even more daunting challenge in the Sana’a Basin Project. The Sana’a project (and the second generation project in Taiz) will require great imagination and hard work from the Task Team. It will also require that management support the team and insist on a project design and implementation plan which (a) addresses core and contentious issues identified above and (b) ensures that very limited Yemeni implementation capacity is focused on the core issue, and (c) avoids the temptation to add bells and whistles.

### **(c) Another aquifer management project for consideration....**

The Bank is thus engaged in two of the most difficult and urgent groundwater management problems (in Taiz and Sana’a). An important strategic question for Regional management is whether a strategy which deals only with the most difficult problems is appropriate or likely to succeed, since developing sustainable institutional arrangements for managing groundwater is a very difficult task under the best of circumstances. Accordingly, a case could be made for supplementing the existing portfolio with a groundwater management project which offered a greater chance of success. (For example, it was suggested, in the relatively prosperous and relatively homogeneous irrigation communities in the Ibb region.) The point being that a strong case can be made for “picking the low-hanging fruit”, and getting an example in Yemen where a solution is more likely. The demonstration effect of “a success” would be a huge boost in showing that it is actually possible to develop institutional arrangements for the sustainable management of groundwater in Yemen.

### **(d) Components of other rural projects designed to improve groundwater management....**

As described earlier, the overwhelming priority for water resources management in Yemen is groundwater, and the overriding priority is to find institutional mechanisms for achieving sustainability. The Taiz (and now Sana’a Basin) projects are the only projects in the Bank portfolio (or in Yemen more generally, for that matter) to address this issue head on.

There are, however, components of other Bank-financed projects which have a role to play in more effective use and management of groundwater. During the field visits we were accompanied by the Yemeni Project Manager for the Bank-financed Land and Water Conservation Project. An important focus of this Project is on demonstrating and disseminating more efficient irrigation technologies. At the Project Manager's suggestion, we visited two LWCP sites (in Wadi Zabid and Wadi Tuban). We also discussed similar technological approaches with irrigators in Wadi Habir.

There is no question that technologies which use water more efficiently must play a key role in modernizing groundwater use in Yemen. But, from our field visits and discussions with the Project Manager and users, several issues surfaced. First, in one of the sites visited (Wadi Tuban) the bubble nozzles on a demonstration farm were not working for some time, and had mostly been removed by the operators. Second, as has happened in many places where water rather than land is the binding constraint, it would appear that farmers equipped with more efficient irrigation technology have not reduced pumping but simply increased the irrigated area. Third, there appears to be no effort to assess the degree to which improved on-farm efficiency represent real water savings at the aquifer level, or whether the apparent "losses" recharged the aquifer. (In the words of the excellent Bank-financed Local Water Management Study, LWMS, "*most irrigated lands are located on highly permeable soils of wadi beds. Much of the water "wasted" through inefficient irrigation practices infiltrates and becomes available for downstream users. Thus losses in the normally accepted sense are in fact largely return flows to the aquifer which are reused in the same hydrological system*". Fourth, there appears to be no systematic system for assessing the basin-wide impact of water management proposals (such as the "small retention dams" idea favored by the Ministry of Agriculture and some Bank staff). Again, in the words of the LWMS "*dams will probably only serve to shift water away from downstream users dependent on occasional spates and already suffering from depletion problems*". In short, while the introduction of improved technologies must play an important role in Yemen, there appears to be relatively little attention to the vital issue of basin- or aquifer-level impacts of such technologies, and little attention to the institutional context which is required if these technologies are to reduce aquifer mining.

There are some other important advances in Bank-financed irrigation projects. Innovative financing is a feature of the Southern Governorates Project and participatory irrigation management is a key issue in the up-coming Spate Irrigation Project. But from the results of the consultation, as well as discussions with officials in the Agriculture Ministry, it would appear that the Bank has been relatively less active in a policy dialogue on irrigation and drainage than in a similar dialogue on water resources management and urban water supply.

### **(e) Some observations on the Bank's activities in water supply and sanitation**

The technical and financial performance of most urban water utilities in Yemen is poor. But there is concurrence among all that the water supply and sanitation sector is the sub-sector where policy change is happening fastest. A central element is dynamic Yemeni leadership. Over the years a set of principles for the urban water sector ("the Rada'a principles") have been agreed upon. And for the past several years GTZ has financed the Water Sector Reform Unit, which has energetic and effective leadership. Yemeni leadership has meant, inter alia, that there has been good donor coordination in this area. The Bank has played an important supporting role, with a particular emphasis on pushing the envelope for private sector involvement. Overall – with a few dissenting voices – the participants at the consultation supported the thrust of "greater private involvement" which has characterised the Bank work in the urban water sector.

That said, there are several threats which, in our view, must be addressed now or the (sound) overall strategy will not succeed.

The first of these relates to the sense – expressed by most of the workshop participants – that “concern for the poor” was not an important element in the Bank’s work on urban water supply. One response, and important one, is that the best thing for the poor is a well-functioning utility which will provide them with a good quality service at reasonable cost (and enable them to stop buying expensive water from vendors). But this is not enough. Not only should there be greater attention to the needs of the poor (through innovative arrangements, perhaps involving the informal private sector operators who currently provide such a large proportion of service), but serving the poor should be seen to be a principal objective of the Bank work (and of the associated involvement of the private sector). This will require both technical ingenuity, and a lot more social assessment and assessment of the capabilities of informal institutions (such as the existing private water providers). Experience elsewhere has also shown that attention to the needs of the poor is an essential element in building and maintaining a social consensus for involvement of the private sector in urban water supply.

Many participants at the workshop were also concerned with sanitation. There are two strands to this concern. First, there has been little attempt by the Bank (or others) to find innovative, low-cost urban sanitation solutions in Yemen. We understand from Regional management that attention is now turning to this issue. A strong case to be made for a presence by a program like the (Bank-administered) Water and Sanitation Program.

The second strand is that there are a number of highly-questionable investments being made by other donors in sophisticated wastewater treatment facilities. We visited the almost-complete Sana’a activated sludge plant, and discussed the planned Zabid plant with the manager of the utility in that town. There is no doubt that, in some of these cases at least, these are poorly thought-through donor-driven projects which will (a) either saddle the embryonic utilities with enormous operational and financial burdens (under optimistic assumptions of connection rates, water and sewerage rates in Zabid would have to increase five-fold to account for depreciation of the proposed sewerage system) or (b) be abandoned shortly after construction. The fact that the Bank is not financing these is of only little comfort, because it is the utilities which we are engaged with (the Sana’a Branch of NWSA, for example) who will have to face the operational and financial liabilities. There is, accordingly, a need for the Bank to work with the Yemeni leaders of the urban water sector and with other external support agencies to develop a more effective framework for urban sanitation.

In a similar vein, water utilities in Yemen do not have the luxury of leaving the issue of water resources management to others. As the case of Taiz – where water comes to residents only once a fortnight – illustrates so vividly, utilities have to be active in working with NWRA and others in finding effective mechanisms for (a) sustainable management of aquifers and (b) developing market-based mechanisms for the voluntary transfer of water from irrigation to the growing cities.

Once again, the strategy for dealing with these must not be ideal but realistic. It must take into account the limited (even if growing) Yemeni institutional capacity in the water and sanitation sector. It must find ways of strengthening that capacity in critical areas. And it must “leave to tomorrow” the things that are desirable but not absolutely critical.

Finally, while noting that there is an upcoming Bank-financed rural water supply project, we paid little attention to the (important) issue of rural water supply, basically because the quantities used are so small that rural domestic uses do not figure prominently in the water resources management dilemma. However it is relevant to note that many rural users depend on shallow

groundwater and thus are adversely affected, severely in many cases, when overall water tables decline as a result of groundwater mining. In other words, if aquifers are managed sustainably, rural domestic water users are major “winners”, no matter how such sustainability is achieved.

## **7. WHAT THESE OBSERVATIONS MIGHT MEAN FOR THE BANK’S WATER RESOURCES SECTOR STRATEGY**

The primary purpose of the country reviews is to bring to the surface issues which are germane to the formulation of the Bank’s new Water Resources Sector Strategy. What, from our observations in Yemen, might some of the generic issues be?

### ***Are we realistic about what change is possible?***

In our focus country analyses we assess the “background conditions” using, inter alia, measures of economic and political freedom. Yemen is in the “lowest group of countries” in terms of both measures. Yemen is thus very far from the normative view of a modern country. Furthermore, the role of the government is severely proscribed, with de facto power often residing with tribal leaders. These historical, cultural and political realities have profound implications for the process of change, in the water sector as elsewhere.

The Bank and the Fund have long been accused of writing “the same prescription no matter what the illness”. While we do believe that there are global lessons of experience, it is also obvious that the possibilities of, say, a Yemen, are vastly different from, say, those of Brazil (our first focus country). This “genericism” is coupled with a tendency in the Bank today to either (a) wish away political realities that we don’t like, or (b) assume that we can change them. By burying our heads in the sand, we do all, especially the poor, a disservice, as we hope the detailed on groundwater management illustrates.

How does this require that we change the way in which we do business. First, it requires that we be more realistic and candid in our assessment of reality. (In a small side meeting during the consultation, the articulate Yemeni Minister of Planning repeatedly said that “the Bank must be more candid with us”.) Second, this is usually going to mean settling for second and third best solutions, and compromise rather than ideal goals. In our view the Taiz discussion provides a vivid illustration of what this means in practice.

### ***Do we tailor our strategy in accordance with local capacity?***

Bank staff and all participants in our consultation repeatedly identified lack of institutional capacity as a critical constraint. In such an environment, it is absolutely essential to concentrate the very limited institutional capacity on the highest-priority tasks, even when this means that a plethora of “good things” cannot be done. In the Bank’s most important water resources project in Yemen (attempting to deal with the management of groundwater in Taiz) so many bells and whistles (each with laudable objectives) have been added, that the project is unimplementable and the project implementors have lost sight of the woods for the trees. The best has become the enemy of the good.

### ***Do we do enough assessment of the political economy of change?***

A corollary of the above is that we need to apply the tools of social and political assessment both more intensively, and more realistically. We have to understand what forces will support and oppose change, and what their strengths are.

MNSRE staff claim that they have made extensive use of social science inputs, especially into Taiz. This is unquestionably correct. We have two observations on the work that has been done. First, some of this work is world class. In particular the Local Water Management Study is probably the best piece of Economic and Sector Work done on either groundwater or water institutions anywhere in the Bank. But in our view, a lot of the more recent social science inputs have not been productive for several reasons. First because they have been directed primarily at fighting the fires associated with all the community service issues (which are unrelated to groundwater management). Second, because the small social science inputs that have been focused on sustainable water management have taken place in the absence of a clear and compelling logic for institutional mechanisms for attaining sustainability. And third, because critical inputs from experienced social scientists have sometimes been disregarded. For example, the social scientist on the Mid Term Review (MTR) of the Taiz Project raised a series of fundamental issues (for instance “*the project has no mechanisms to implement its major activity, namely the introduction of improved water management mechanisms*”) which were ignored in the MTR Report.

The upshot is there is a disconnect between the intensive and high-quality analytic work on social issues and the political economy of reform, and the use to which social and political insights have been incorporated into project design and implementation.

***Is it possible to develop objective indicators of performance which are robust across sector, country and region, and does the effort to do this help?***

As shown in the data diagrams from the consultation, there was unanimity among the Yemeni participants that implementation is the great challenge. And similar unanimity that, in Yemeni and Bank projects in the water sector alike, implementation is unsatisfactory. The systemic and severe environmental and service problems confirm that this is true.

Yet, remarkably, OED assessments show that in only one of the six water projects completed between 1994 and 1998 were outcomes rated as “unsatisfactory”. And until recently none of the five FY99 active water projects is considered a “problem project” by the Bank. (One project, the Taiz project, has recently been re-rated and is now considered a “problem project”.) These numbers are superior to averages for these sectors in MENA (where Yemen is the most difficult country) and even better when compared to Bank-wide averages.

These numbers raise a series of generic questions about relative and absolute performance, and about the use to which such data are put in the Bank. In the specific case of water in Yemen, Bank staff have made a major effort to improve the quality of the portfolio, and there is little doubt that this has been worthwhile. So the focus on portfolio quality has been helpful in improving the quality of Bank projects.

But “project ratings” are used not just as a stimulus to better implementation (for which they are useful), but as a tool for comparing the performance of Bank projects in different sectors, countries and regions. And here the Yemen data (like the data from any country) raise a series of difficult questions:

- can we say that Taiz, the only project which has attempted to address the fundamental water resource management problem in Yemen is the only “failure” out of a portfolio of twelve projects?
- is the implicit incentive to “aim low and get there” appropriate given that our aim is to maximize the Bank’s development impact?
- are there specific strategies against which to measure Bank performance, and are these strategies sufficiently nuanced for country realities?

- is it possible to compare the performance of, say, socially very complex water resource management projects with more straightforward water utility projects? and
- is it appropriate to demand high financial performance from urban water utilities and have no financial covenants for irrigation projects, which are also providing services to users?

## **Annex 1: Who participated in the Sana'a consultation, and what did they think of it?**

### The Participants:

The workshop participants were:

- 2/3 Yemeni and 1/3 expatriates;
- 60% were government officials, 30% from international agencies, and 10% from Yemeni civil society.
- Most participants were engineers (70%), with a sprinkling of economists, environmental scientists, and agriculturalists.
- Sector affiliation was evenly split between: WRM, I&D, and Agriculture.
- Most people had either worked directly on World Bank projects, or were project stakeholders (70%).

### Their view of the consultation:

On a rating of 1 “least favorable” to 6 “most favorable” the following were the mean assessments of the 42 participants who completed the questionnaire.

Clarity of objectives	4.9
Quality and usefulness of presentations	4.7
Design of the consultation	4.2
Overall	4.4

## Annex 2: What the Participants thought of the Bank's work on water in Yemen

### World Bank Effectiveness

Respondents were asked to evaluate the Bank's effectiveness in response to the questions listed below. Answers were scored according to the following scale, and average and standard deviations are presented for each question.

Not Effective	Limited Effect	Moderate Effect	Very Effective	Don't Know
1	2	3	4	Not Scored

<b><i>Water Resources Management Objectives</i></b>	Average Score	Standard Deviation
<b>Is the Bank effective in helping Yemen in:</b>		
• Adopting a comprehensive, multi-sectoral approach to water resources management, including the environment.	2.6	0.8
• Developing an institutional framework for water resources management that includes participation and appropriate decentralization.	2.5	0.8
• Treating water resources as an economic good and adopting "user pays" and "polluter pays" principles.	2.3	0.7

<b><i>Irrigation and Drainage Objectives</i></b>	Average Score	Standard Deviation
<b>Is the Bank effective in helping Yemen in:</b>		
Establishing participatory irrigation user organizations that manage their own systems.	2.2	0.8
Achieving cost recovery sufficient to allow irrigation user organizations to achieve financial autonomy.	1.9	0.8

<b><i>Water Supply and Sanitation Objectives</i></b>	Average Score	Standard Deviation
<b>Is the Bank effective in helping Yemen in:</b>		
Establishing autonomous and decentralized water utilities under an appropriate regulatory framework.	2.8	0.9
Achieving cost recovery for water utilities sufficient to allow for financial autonomy.	2.5	0.9
Helping the poor in both rural and urban areas meet their water supply and sanitation needs.	1.9	0.9

<b>Specific Objectives for Yemen Is the Bank effective in helping Yemen in:</b>	<b>Average Score</b>	<b>Standard Deviation</b>
Returning groundwater use towards a sustainable basis.	1.9	0.8
Facilitating transfers of water from rural to urban areas.	2.0	0.6
Increasing the coverage of clean water supply and sewerage to improve health and reduce poverty?	2.4	0.8

### World Bank Operations

Respondents were asked to indicate the extent to which they agree with the following statements regarding Bank operations. Answers were scored according to the following scale, and average and standard deviations are presented for each question.

Do Not Agree	Minimal Agreement	Generally Agree	Competely Agree	Don't Know
1	2	3	4	Not Scored

<b>Question</b>	<b>Average Score</b>	<b>Standard Deviation</b>
1. Deals with the critical water issues, even if they are difficult and controversial.	3.0	0.7
2. Bank lending operations are effective in helping Yemen meet its development objectives.	2.5	0.9
3. Has made a major contribution with its analytic work (e.g., sector reports, country strategies) in the water sector.	3.3	0.6
4. Uses the right mix of lending (projects) and non-lending (workshops, study tours, analytic work) activities.	2.5	0.7
5. Forms effective partnerships with other international development agencies.	2.5	0.9
6. The Bank listens to, and incorporates, the views of all stakeholders.	2.4	0.9
7. Forms effective partnerships with the government, professionals, NGOs and other actors in Yemen.	2.4	0.8
8. Has competent and committed staff that provide valuable support and advice in the water sector.	2.8	0.8
9. Works together as an organization, across different sectors such as water supply, irrigation, etc., to foster integrated water resources management.	2.7	0.7
10. Concentrates on achieving development objectives, as opposed to emphasizing disbursements, during project supervision.	2.5	0.9

11. Internal procedures, such as procurement and staffing decisions, do not interfere with achieving development objectives.	2.5	0.8
12. Pays enough attention to capacity building and institutional strengthening.	2.3	0.8
13. Protects the interests of the poor and disadvantaged.	1.7	0.8
14. Makes good use of its leverage outside of the water sector (e.g., with the Planning Ministry, press, and politicians).	2.6	0.7
15. World Bank conditions for water loans (e.g., financial, institutional, and policy requirements) helps improve water management in Yemen	2.7	0.8
16. Has a good understanding of political factors and constraints in promoting reforms in the water sector.	2.6	0.8

