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# Political Economy and Political Risks of Institutional Reform in the Water Sector

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An approach combining structured analysis of political economy and expert opinion is developed and used to estimate the political risk associated with implementing a series of institutional reforms in Pakistan's water sector.

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## Summary findings

It is difficult and time-consuming to get adequate information about influence groups in a society. Dinar, Balakrishnan, and Wambia develop an approach to estimating the political risk associated with implementing a set of institutional reforms in the water sector. Their approach endogenizes the actions taken by politicians, users, service providers, and other stakeholders. Their analysis provides insights into the relationships between institutional arrangements, the power structure, and policy outcomes.

The authors develop a two-tier tool to assess the risks associated with implementing reform. The first tier is a structured analysis of the distribution of power among groups interested in the outcome of reform. The second tier is a Delphi process, based on experts' opinions.

Their approach is a compromise between the two options: the first (structured analysis) is costly and time-consuming and often entails creating and using pseudo-precise indices; the second (Delphi) process is an unstructured "expert opinion" way of assessing risk.

Their compromise approach provides a manageable framework that, after some testing, could be added to the feasibility analysis of projects undertaken in politically complicated environments.

They apply the approach to the National Drainage Program Project, currently in the early stages of implementation in Pakistan. They describe risk mitigation strategies that should be followed in dealing with political risks associated with the project.

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This paper — a joint product of the Rural Development Sector Management Unit, South Asia Region, and the Rural Development Department — is part of a larger effort in the Bank to appraise the National Drainage Program Project in Pakistan and apply the approach to other water-related projects with institutional reform components. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Fulvia Toppin, room S8-220, telephone 202-473-0450, fax 202-522-1142, Internet address [ftoppin@worldbank.org](mailto:ftoppin@worldbank.org). The authors may be contacted at [adinar@worldbank.org](mailto:adinar@worldbank.org), [tbalakrishnan@worldbank.org](mailto:tbalakrishnan@worldbank.org), or [jwambia@worldbank.org](mailto:jwambia@worldbank.org). September 1998. (40 pages)

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# **POLITICAL ECONOMY AND POLITICAL RISKS OF INSTITUTIONAL REFORMS IN THE WATER SECTOR**

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## INTRODUCTION

Institutional reforms associated with changes in power and/or benefit distribution inevitably create considerable political opposition. The conventional view of institutional change is that it is either in the interest of economic efficiency, or it merely redistributes income (Bromley 1989). In this regard, interest groups form and attempt to impact the decision-making process so that the end result best serves their interests.

Powerful vested interests of political groups may slow, divert, or even stop a desirable reform. The larger the number of interest groups, the more complicated the implementation process is likely to be. Recent resource-development and resource-use-improvement projects emphasize the combination of physical and institutional investments (Cummings et al., 1996). In such projects the sustainability of infrastructure investments is dependent on the performance of the institutions which manage them. Therefore, it is important, in such projects, to analyze the level of political risk associated with the implementation of the suggested institutional reforms. In this regard, Eggertsson (1997) stresses the need for approaches that allow interaction of economic, political, and social activities, in order to improve the design of economic policies and minimize the likelihood of policy failure.

Recently there has been an increased emphasis on institutional reforms in development projects in the water sector in many countries around the world. These changes have been caused by several factors, including, inter alia: increasing awareness regarding water availability; second, most of the suitable sites for the construction of large dams and reservoirs have already been developed; third, the increasing demands for fiscal austerity in most countries have resulted in growing interest in least-cost alternatives for meeting water needs; fourth, increased awareness about the environmental impacts related to the construction of hydraulic infrastructures; and fifth, competition by various sectors for scarce water resources has increased as a result of growing population and increased economic activity. These changes have caused a fundamental shift from relying on additional construction as a means for solving water needs, to improving water resource management and institutions of individual countries.

There are several examples of water-related projects which combine infrastructure investment, with components of either institutional reforms, or other non-structural interventions (e.g., pricing). We provide two examples of recent water-related projects that have a mix of such components.<sup>1</sup>

The first example is from Morocco. The Government of the Kingdom of Morocco is undertaking a major long-term irrigation improvement project, estimated at \$367 million (World Bank, 1993). The share of agricultural consumption of available water is estimated at 83% and 79% in 1990 and 2020, respectively (World Bank 1995). Since irrigated agriculture is the major consumer of available water resources in Morocco, this sector is targeted for technical and institutional reforms aimed at improving water use efficiency. The institutional building and policy reforms component of the project is aimed at improving the management capacity of water suppliers, enhancing their service quality and financial sustainability. At the same time, water pricing policies have been modified, including all necessary legislation, to increase water charges to better cover true operation and maintenance (O&M) costs, and to better reflect the scarcity value of water in Morocco. The share of the institutional building and policy reform component in the original project budget was \$76.3 million.

During the first three years, the project in Morocco faced delays and political difficulties, some of which were associated with implementation of the institutional and policy reforms. These delays were mainly due to the attitude of the Government and water suppliers' (ORMVAs) and the Government. The ORMVAs initial negative attitude was motivated by possible loss of power, prestige, and additional financial support. They also opposed having more responsibilities and more complicated work without any additional compensation. The Government's reluctant attitude may be explained by the fact that there was a transitional Government unwilling to undertake major policy changes during the four years of project implementation, but that are now being implemented (Nguyen, 1998).

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<sup>1</sup> Additional World Bank experience with institutional analysis include Brinkerhoff (1994) who analyzed 80 randomly selected projects, and Morss (1984), who focused on African countries. Although these two studies provide insight into the structure of projects with a significant institutional component, the analysis does not specifically address implementation problems due to opposing interests of interest groups.

Although, the institutional changes described for the water sector are strictly internal, it would be useful to mention difficulties associated with institutional reforms that have been experienced before in Morocco (Haggard et al., 1995 pg. 75): “In 1981, after lifting subsidies on basic foodstuffs in conjunction with an IMF program, Morocco experienced widespread riots ... . ... the experience of 1981 was that the government had acted too quickly, that it had failed to develop a compelling strategy of communication and that in lifting subsidies it had not taken into account the cost to the poor.” As a result, the government amended the IMF plan in 1985 by reducing subsidies on some basic foodstuffs, and by implementing the plan gradually. The implication of the IMF experience to our study are that policy reforms are likely to face substantial opposition from several segments of the society--some of which may only be weak pressure groups. The ability to undertake policy reforms in Morocco is dependent to a great extent on the synchronization of the activities over time and across society segments.

The second example is from Pakistan. The Government of Pakistan and its four provinces are introducing major reforms in the organization and management of its irrigation and drainage system (World Bank, 1997). These reforms are being supported by a National Drainage Program (NDP) Project, which includes, among other components, an institutional reform component (\$58 million) and an investment component (\$683 million). The proposed reforms would primarily entail a shift in policy and strategic decision making responsibilities away from federal and state administered agencies to decentralized autonomous public utilities and end users: Farmers’ Organizations (FOs)—including small farmers. The reforms would facilitate greater use of market mechanisms, a greater role for the private sector in on-farm capital investment, in water allocation, and in operation and maintenance (O&M). The reforms consist of mainstreaming beneficiary participation i.e., involving beneficiaries substantially in the construction, management and financing of the irrigation and drainage system; redefining the role of government to perform only its legitimate functions in the management of the system; establishing arrangements to ensure that service agencies carry out their functions by adopting satisfactory business practices with focus on customer service and financial sustainability; and by professionalizing public irrigation institutions.

Some of the reforms described above may reduce the economic influence of some of the water or drainage service providers on end users, and of end users on service providers. In this

paper we attempt to describe ways and means by which such reforms affect various interest groups (including government agencies and users), and how each group may affect the implementation of each reform. We also attempt to develop an approach to estimate the political risks associated with implementation of institutional reforms in the water sector. We first describe ways in which political impacts and political risks were handled in the literature dealing with various reforms and economic adjustment projects. The survey of the literature provides some needed qualitative relationships observed over the years in various countries. Then we propose a procedure which can be used to calculate the political risks, expressed as the likelihood of achieving a given reform. We use available data from the NDP project in Pakistan (World Bank, 1997) to apply our framework; and make linkages to the political economy of the water and drainage sector as they are reflected through the NDP project. We focus on the major institutional reforms and the main interest groups associated with the NDP. We conclude by providing for risk mitigating and management that should assist the government of Pakistan to cope with the political risks of the various reforms in the NDP.

### **POLITICAL ECONOMY OF REFORMS, POLITICAL INFLUENCE AND POLITICAL RISK ASSESSMENT**

To be able to assess the political risks associated with institutional reforms, it is necessary to know how the stakeholders (also called interest groups or players) are affected by the reforms, what their interests are, and their ability to impact the reforms. A quantitative evaluation of risk can be estimated once the extent of the political effects on the institutional reforms is known.

Although the literature contains a rich set of studies on the political economy of institutional reforms in general (Paul, 1990; Azis, 1994; Bromley, 1989; Nelson, 1992; Haggard et al., 1995; Rose-Ackerman, 1997; Stallings and Brock, 1993), and in the agricultural sector in particular (Bhalla, 1991; Brandao and Carvalho, 1991; Garcia, 1991; Nabi, 1986; Hamid et al., 1991; Rose-Ackerman and Evenson, 1985; Sturzenegger, 1991), very few studies exist that address the political economy of reforms in the water sector. In addition, to the best of our knowledge the literature does not provide direct quantitative estimates of political influence and the political risk of reforms. However, the available literature provides several directions which

will be reviewed later, and which will be used as a basis for the framework to be developed in this paper.

Haggard et al., (1997) provide an excellent background of the main issues of political feasibility of adjustment in developing countries. Although their study addresses the broader issue of adjustment programs imposed on a country, such as involving international agencies and governments, many of the findings, especially those associated with the tactics of reform implementation, the role of interest groups, and the behavior of the social groups, are relevant to the case dealt with in this paper.

As correctly pointed out by Haggard et al. (1995), interest-group analysis is not straightforward, and especially so as characteristics of their behavior in developing countries differ significantly from those of developed countries. Several limitations affect our ability to analyze interest group impact. They include (1) collective action problems—the ability of groups to organize and influence; (2) problems in identifying exogenous-endogenous reactions to the reform design—i.e., the design and the implementation sequence affect the interest group reaction, and (3) problems in identifying mechanisms through which interests are translated into policy—e.g., strikes, bribes, etc. Haggard et al. (1995) also point out that (1) dormant interest groups may become acute under certain circumstances, (2) unexpected coalition combinations may take place under certain circumstances, and (3) the combination of *a-priori* weak interest groups and certain mechanisms of translating their interests, may be found very effective (e.g., violent demonstrations of the poor).

Paul (1990) reviewed 55 World Bank's Sector Adjustment Operations between 1983 and 1987 that include institutional reforms in the agricultural, trade and industry sectors. Among other interesting results, he found that in some cases the entrenched political and hostile bureaucratic forces within the institutions pose serious problem. Using the example of Brazil's trade reform, political resistance and lack of commitment on the part of the export credit agency of the Central Bank of Brazil contributed to the problems of implementing the necessary reforms.

Stallings and Brock (1993) refer to the lessons from the economic reforms in Chile between 1973 and 1990. Referring to two reforms—trade liberalization and privatization, the authors found that in the case of trade reforms, creation of coalitions that were *a priori* opposed to the reforms, was expected. However, losers who had more reasons to organize had much less

ability to do so. In the case of privatization, pressure for reform came from the government and from the business sector, while labor organizations were not active in the process.

Sturzenegger (1991) described agricultural price interventions in Argentina between 1960 and 1985. Lobbying for and against this type of intervention, interest group activities took various forms, such as meeting with policy makers, conducting studies that support the interest group's point of view, monetary contributions to legislators, public opinion campaigns, and direct participation in government by members of interested groups. The author recognized the relative advantage of various groups to organize an effective lobby, both in terms of the results and the associated influence cost. The two interest groups—the agrarian lobby and the industrial lobby—differed in that respect. In addition, the author identified conditions (price and direct tax levels) for the intensive involvement of the agrarian sector. Since the industrial sector included both input providers and agricultural product processors, the industrial group faced opposing interests.

There is no prescription for measuring political impact and political power of various players involved in institutional change, nor does a formula exist for the cases described earlier. In most cases there is also no data that can directly measure power and influence.

The empirical literature suggests the use of proxies to measure political influence of interest groups. For example, Ando (1997) estimated pressure by interest groups to impact the Endangered Species Act in the USA, by using a number of comments submitted by groups for and against a particular species to be included in the Act. Cukierman and Webb (1997) measured political influence on central banks' policies in various countries by looking at the probability that a central bank governor will be replaced shortly after a political change in government.

Rose-Ackerman (1997) reviewed several ways in which parties may influence the executive, legislative, and the legal systems by corruptive bribes. Influencing by bribes has a clear advantage to the party that uses it as an influential tool. For example, bribery allows the party to increase allocation of scarce resources, reduce production costs, increase production quotas, and buy judicial decisions.

Nelson (1992) compared various institutional reforms *vis-a-vis* the relation between various actors that have a stake in the reform outcome, such as unions, governments, political parties, and the urban and rural populations. Influence by those parties was detected in various

countries that undertake institutional change and economic adjustment programs. The main influencing means were strikes, protests and riots.

Browne and Paik (1994) studied the support and opposition to farm policy initiatives by U.S. legislators. Their main finding was that policy makers support certain policies lobbied by the agricultural sector only if they serve another interest group (e.g., non-farm sector) that is part of their constituency. They measured political influence of interest groups by density of farm/non-farm population and by farm/blue collar population shares. The key findings were that policy makers support agricultural policies only if they serve interests of other constituency groups that are closely associated with the agricultural sector.

Rose-Ackerman and Evenson (1985) estimated the determinants of allocation of agricultural research and extension funds by state policy makers. They found that farmers influence of policy makers is correlated with their share in the state population, with farm income share, and with the number of farmer-elected legislators.

From the studies surveyed it can be generalized that reforms of any kind are likely to face the opposition and support of certain groups. The level of opposition or support is, in turn, determined by the change of power and benefits of each affected group compared with the status quo. Reforms may create new coalitions that were not in place, or were not even predicted before. The ability of a group to influence the implementation of a reform is a function of many factors, and is very complicated to generalize.

## **ESTIMATING POLITICAL RISKS OF INSTITUTIONAL REFORMS**

Establishing a quantitative framework to assess the likelihood of accomplishing institutional reforms associated with a specific project is not a straightforward task. Supporting data from which probabilities can be calculated, do not generally exist. However, a useful procedure for estimation of such probabilities has been suggested by Raiffa (1982), and is used in association with a Delphi approach (Preble, 1983; Woudenberg, 1991; Buck et al., 1993) to estimate the probabilities for achieving the desired reforms. The process consists of: (i) an evaluation of the

potential winners and losers<sup>2</sup> from the reforms; (ii) identification of the various reform performance levels; (iii) identification of means by which the various parties may influence the level of achievement of various reforms; (iv) identification of costs to (i.e., effort required by) each party to influence the achievement levels; and (v) thereafter applying the Delphi approach to estimate probabilities of level of achievement of each reform.

The approach is based on a two tier procedure. The first tier is comprised of an evaluation of the process of reform implementation, identifying positively net gainers and negatively net losers, the parties' objection to and support of each reform, and the cost, to each party, of influencing the reform outcomes. Using the information in the first tier, a Delphi approach is applied in the second tier to calculate probabilities of risk associated with the implementation of the analyzed reforms. The process is presented in Figure 1 and described in detail in the following sections.

#### **IDENTIFICATION OF THE PLAYERS AND THE REFORMS**

If the number of players and the number of reforms cannot easily be handled, then a selection of a sub-set of players and reforms must be performed to ensure a workable set while capturing the essence of the problem. For example, reforms with relatively stable outcomes, and players with little influence should be eliminated from the analysis.

#### **PLAYERS' INFLUENCE ON THE REFORMS**

It is expected that each of the institutional reforms will be affected by both political opposition on the part of some players, and political support on the part of other players. The level of achievement and the time frame for implementation of a particular reform can be affected by active opposition or support. The actual achievement level will be the outcome of that process.<sup>3</sup>

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<sup>2</sup> The term "winners and losers" or "gainers and losers", taken from the political economy literature (e.g., Stallings and Brock, 1993, pg. 100; and Bhalla, 1991, pg. 222), is used here in conjunction with parties who may gain more and parties who may gain less from a prospective reform.

<sup>3</sup> For purposes of this analysis, we have held all other potential determinants of performance outcome constant. These include such variables as implementation capacity, the policy environment, resource endowments and initial allocations, the overall economic environment, and natural factors.

There are various means by which players interfere in the reform's implementation process. It should be noted that some players may support or oppose a given reform in a passive way.

#### **PLAYERS' TRANSACTION COST OF INFLUENCING REFORMS' LEVEL OF ACHIEVEMENT**

The cost of influencing a particular player is a function of his/her existing political power, and of the magnitude of change it wishes to incorporate into the proposed reform. Players can influence policy makers by demonstrations, by meetings and presentation of their political positions, or simply by monetary means of future support of a policy maker that affect his/her immediate decision.

#### **ESTIMATING THE LEVEL OF ACHIEVEMENT**

Based on the variety of actions and the cost (also measured by level of effort) associated with the players' attempt to affect the reform, a measure of the reforms' achievement level can be estimated. Three levels of achievement are considered in our framework: a high/full level, a medium/partial level and a low/failure level. Achievement can be measured both in terms of fulfillment of the reform components, and the time frame needed for such achievement.

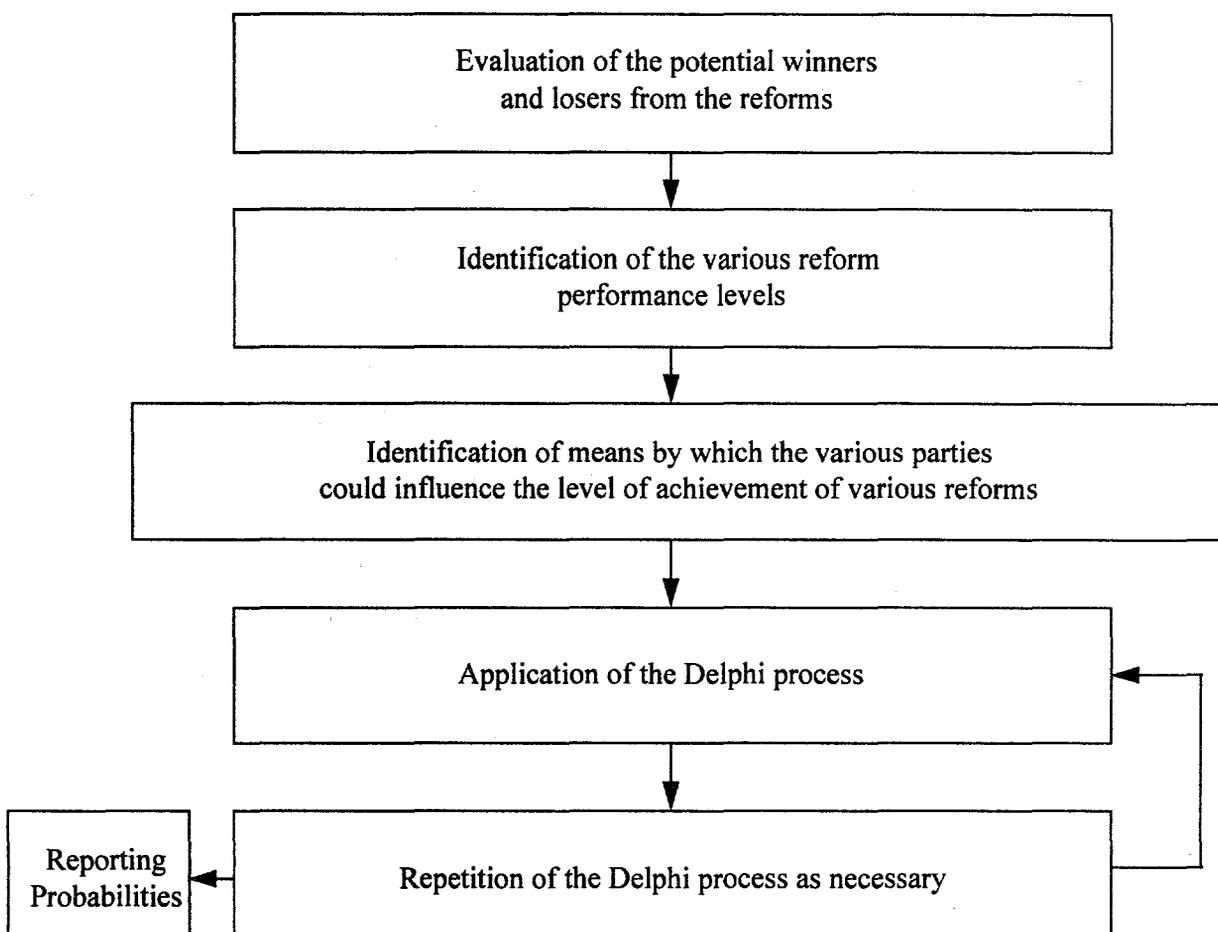
#### **ESTIMATING THE LIKELIHOOD OF ACHIEVEMENT OF THE VARIOUS REFORMS' LEVELS - THE DELPHI PROCESS**

The information provided in the tier one procedure is then used in a Delphi process (Preble, 1983). We assumed that the reforms are independent of each other, so implementation of one reform does not affect the others.<sup>4</sup> To simplify, we assumed further that achievement levels are not continuous. We ranked achievement levels as "Low", "Medium", "High", and "Very High." We attached a four-stage value scale to the probability for achieving each level, namely: (1) Low 0-25 percent, (2) Medium 26-50 percent, (3) High 51-75 percent, and (4) Very High 75-100 percent. We repeated the Delphi process until convergence was achieved. We defined convergence as the attainment of an empirically determined level (CV) of the coefficient of variation (CV).

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<sup>4</sup> This assumption is necessary for analytical purposes in order to apply the Delphi technique. In reality, the reforms can be expected to have complex and dynamic interactions that would require more sophisticated techniques to analyze or predict.

Figure 1: A process for estimating the political risk associated with institutional reforms



## POLITICAL ECONOMY OF THE WATER AND DRAINAGE SECTOR IN PAKISTAN

Because data was available for the NDP project in Pakistan (World Bank, 1997), we applied the analytical framework from the previous section to estimate the political risk of institutional reforms in the water and drainage sector in Pakistan.

### THE AGRARIAN ECONOMY

An understanding of the country's agrarian economy is essential to the proper realization of the political economy of the water and drainage sector in Pakistan, at least among the various segments of the farming community. Naved et al. (1991) and Nabi et al. (1986) provide an excellent background on the agrarian sector of Pakistan. The agrarian sector of Pakistan is characterized

by big income distribution differences between different types of agricultural producers. Thus, landowners vs. tenants, and big vs. small farmers will benefit differently from various input and output pricing reforms. We postulated that institutional reforms would also benefit them differently.

Nabi et al. (1986, pg. 72) argued that, in Pakistan, subsidies to factors of production, such as water, do not reach the targeted population for which they are intended. They argue that "What is generally ignored when such subsidies are advocated is that because of the existing distribution of assets and power, all farmers do not have equal access to inputs... subsidies on water is a perfect example of this. Water rates in Pakistan are highly subsidized supposedly to benefit small farmers but most of this subsidy goes to large farmers because of unequal access to water."

In another study, Hamid et al. (1991) estimated that without price intervention the income of Pakistani small farmers in 1980 would have been 2.4-2.8 times higher, and that of large farmers 3.0-3.5 times higher than with intervention. As predicted, it has been confirmed that large farmers in Pakistan have opposed price intervention in agriculture because they have more gains from the status quo in agriculture.

Although small and big farmers in Pakistan are only two of several stakeholders in the water reform called upon, the above discussion demonstrates how both groups would relate to the proposed institutional reforms under NDP.

## **THE IRRIGATION SYSTEM**

Pakistan has the largest integrated irrigation network in the world. The system is fed by the waters of the Indus River and its tributaries. Since 1947, Pakistan has implemented the Indus Basin Replacement Works Project (IBRWP) with the World Bank's help as the lead donor. Under the IBRWP, 39.54 million acres<sup>5</sup> were brought under irrigation. The salient features of the system are three major storage reservoirs, namely Tarbela and Chashma on the Indus River, and Mangla on the Jhelum River; 19 barrages; 12 inter-river link canals; 43 independent irrigation

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<sup>5</sup> 1 acre = 0.4 hectare

canal commands; and over 107,000 watercourses which are complemented by a surface drainage system comparable in size. The length of canals totals 61,000 kms, and in addition watercourses, farm channels and field ditches cover another 1.6 million kms. The system draws an average of 106 million acre feet<sup>6</sup> (MAF) of surface water each year for irrigation, supplemented by an annual groundwater pumpage of some 43 MAF. With nearly 80 percent of the agricultural land being under irrigation, irrigated agriculture contributes significantly to the economy of Pakistan, where 25 percent of GDP, 50 percent of employment, and 70% of export revenues (directly and indirectly), are from agriculture (World Bank, 1997).

#### **PRESENT STATUS**

Although irrigated agriculture contributes significantly to the country's economy, Pakistan's irrigated agriculture suffers from waterlogging and salinity, over-exploitation of fresh groundwater, low efficiency in delivery and use of irrigation water, inequitable distribution and unreliable delivery of water, and from insufficient cost recovery of irrigation and drainage charges. Waterlogging and salinity are the principal threats to the sustainability of irrigated agriculture in Pakistan. Nearly thirty eight percent of the Gross Commanded Area (GCA) is waterlogged, of which 15 percent is severely waterlogged. Fourteen percent of the surface is saline, of which 6 percent is severely saline. Salinity is estimated to rob farmers of about 25 percent of the potential production of major crops. Due to age, overuse and poor maintenance, the efficiency of delivery of the canal system is low, ranging from 35 to 40 percent from canal head to the root zone. Furthermore, the system which is based on gravity flow, is supply-based and has low use-efficiency. Inefficient water delivery and use also mean that, in reality, water does not reach many users toward the tail-end of the system. Inequity in the distribution of surface water—due to deliveries less than designed levels, poor O&M, and even illegal diversion—is a major concern in Pakistan. Operation and maintenance is inadequately financed. Cost recovery of O&M is perennially inadequate. For example, the gap between O&M expenditures and recoveries in Punjab was 62 percent in 1994-95, and increased to 74 percent in 1995-96; and the gap between O&M expenditures and revenues in Sindh was 89 percent in 1994-

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<sup>6</sup> 1 acre-foot = 1235 cubic meters

95 and 88 percent in 1995-96. Many users and polluters of drains do not even pay for the use of drainage infrastructure. For example, urban centers and industries dispose of municipal waste and toxic effluents in canals and drains without payment or regulation. The poor state of drainage O&M is reflected in the periodic need for rehabilitation at roughly five year intervals. These problems have been identified to result from several underlying factors, including public sector inefficiencies, structure of the agrarian society, the land tenure system, the irrigation system design, and the political economy resulting from the interplay of all these factors. Similar to the situation pertaining to the agricultural sector, the development of a smoothly functioning water and land market is considered essential to eventual resolution of the sector's problems. Institutional and regulatory reforms that facilitates market efficiency and private sector activities are perhaps the most obvious route for implementation of these developments. The government's role should be drastically reduced where market failure is not an issue and government inefficiency is evident (Faruqee, 1995a, b).

A new strategy for water resources development in Pakistan has been formulated as part of the NDP project. It seeks to introduce and mainstream a comprehensive approach to River Basin Management (RBM); to enhance the knowledge base to adopt sound technical solutions to drainage; and to reduce fiscal dependency especially for on-farm drainage. The strategy consists of the following inter-linked parts: (i) restructuring the Provincial Irrigation Departments (PIDs) to form Public Utilities (PUs) around canal commands; (ii) actively promoting the formation and development of Farmer Organizations (FOs); (iii) strengthening federal agencies, notably the Water and Power Development Authority's (WAPDA's) Water Wing, to better implement their federal responsibilities; and (iv) initiating the process of formalizing water rights and eventually of water markets, too. The strategy is clearly dependent on the country's strong political commitment to implement genuine reform in the sector under a properly defined division of roles among public sector, community groups, and the private sector, and within the public sector among the Federal, Provincial, and local governments. The reform program is also dependent upon a decentralized, efficient and participatory institutional apparatus for coordination planning, regulation, construction, financing, management and O&M.

## THE REFORMS

A package of major reforms has been agreed within the framework of the NDP project. The reforms consist primarily of decentralization and management transfer of the irrigation and drainage system from Provincial Irrigation Departments (PIDs) to a multi-tier system of autonomous institutions with clearly defined roles and responsibilities within the system, and with a firm commitment to phase out subsidies for O&M in seven to ten years. The hierarchy of institutions and their roles and responsibilities are summarized below: (i) the role of WAPDA's Water Wing would be re-oriented away from intra-provincial construction to a wider spectrum of inter-provincial functions (including custodial stewardship of the Indus Basin/River aquifer); (ii) PIDs would be converted into autonomous Provincial Irrigation and Drainage Authorities (PIDAs), with responsibility for the intra-provincial aspects of the system from barrages to canal headworks, and from main drains that cross canal commands and major drainage basins to inter-Provincial drains operated and maintained by WAPDA; (iii) self-accounting Area Water Boards (AWBs), initially set up as public utility pilot organizations, would eventually be established around all canal commands to take over and manage the irrigation and drainage system from canal headworks to distributaries/minors operated by Farmer Organizations (FOs), and from the branch drains operated by FOs to main drains operated by PIDAs; and (iv) FOs owned and controlled by farmers would also be encouraged, through a series of pilots, to take over and manage the irrigation and drainage system below the distributaries/minors and subdrains feeding into branch drains operated by AWBs.<sup>7</sup> The FO pilots would be expanded gradually and modified to incorporate the lessons of experience or research. The legal framework for the institutional reforms has been established with the enactment of the PIDA Acts in all Provinces. The Federal Government also intends to reorient the functions and organization of WAPDA's Water Wing towards coordinated management and regulation of the Indus Basin, and streamline WAPDA's organization, internal policies and procedures to increase its overall efficiency.

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<sup>7</sup> A series of parallel project and program interventions supported by the World Bank, Asian Development Bank, and other donors are under preparation to promote the formation of Farmer Organizations (FOs) on a more extensive basis than is envisaged under the NDP. Thus eventually, the NDP would focus its reform program on the tier above FOs.

## THE RISKS

As is inherent in any major reform program, the institutional reforms discussed above carry very significant risks. The proposed institutional reforms, if fully implemented, would be expected to significantly affect the existing power relationships and alliances in rural Pakistan. While the reforms largely seek 'win-win' situations, the perceived (and in part, real) threat of loss of control over the system, particularly by feudal landlords who are unaccustomed to sharing water and power, and by irrigation bureaucrats with financial ties to these interests, who also stand to benefit from the continuation of the institutional status quo, could provoke strong adverse reactions. Large and powerful landlords view the proposed transformation of PIDs into autonomous PIDAs and AWBs, the formation of FOs and the transfer of management responsibilities of the tertiary system to these FOs, and the establishment of water rights as potential threats to their financial and political rural power bases. They also view these changes as a threat to their traditional control over the irrigation and drainage system in particular, and the social structure (feudal system) in general. Some sections of the PIDs, which when transformed would be faced with a hard budget constraint, more accountability, financial transparency and scrutiny, and possibly reduced costs and staffing, might view the reforms as threats to their power, authority and rent-seeking opportunities. Similarly, the proposed strategic reorientation of WAPDA which seeks to transform WAPDA's role from large-scale construction to a knowledge-based RBM organization, and the transfer under the NDP of its construction activities in intra-provincial and on-farm infrastructure to PIDAs, AWBs and FOs, could be viewed by some as a diminution of WAPDA's role in management of the irrigation and drainage system. There is a risk that these vested interests (some of which may have significant political and financial clout) would slow, or even stop, reform. As predicted, the proposed reforms have already provoked strong adverse reactions from these opponents in the form of spreading misinformation, organized political opposition, and bureaucratic delays and stalling tactics including continuous whittling down of reform proposals at various stages during 1996-1998. However, this opposition has ebbed somewhat as the project entered the implemented phase. The sense of threat is also subsiding as stakeholders perceive that the proposed reforms are either less harmful to their interests than initially perceived, or more collaborative and transparent in approach than they originally expected.

Effective FOs will ultimately be essential for the financial sustainability of the irrigation and drainage system. FOs are crucial not only for transferring responsibilities for O&M of the tertiary system (i.e., on-farm drainage and irrigation up to the minor/distributary level) from government to users, but also and more importantly to ensure that the AWBs and PIDAs are held accountable for service delivery, maintenance of physical structures, cost-effectiveness, accurate assessment of charges, and to bring user discipline to water distribution. However, there is a risk that formation of genuine FOs may be very slow especially since the proposed FOs are to be established in a highly differentiated environment with respect to land ownership, water rights and economic needs, and with a mixed record from Water Users Associations and farmers' cooperatives. Feudal landlords could use their existing social power-hold to frustrate social mobilization efforts and prevent formation of FOs. There is also a risk that the proposed FOs could be dominated by feudal landlords, undermining social justice and thereby be ineffective. Finally, there is a risk of bureaucratic impediments that could prevent the FOs from taking over management responsibilities for the tertiary system, despite the enactment of enabling legalization under the PIDA Acts. The loss in terms of equity, cost recovery, and accountability would be significant, and their impacts on O&M of the system (through losses on service quality and cost recovery) would also be significant. In addition, slow formation of FOs would also disrupt the strategy to improve O&M of the tertiary system by transferring responsibility to user groups.

## **ESTIMATING THE POLITICAL RISK OF THE NDP REFORMS**

We illustrate below how we used the analytical framework suggested earlier to estimate the political risk of NDP reforms.

### **FOCUSING ON THE MOST CONTROVERSIAL REFORMS AND THE MOST EFFECTIVE PLAYERS**

In carrying out the risk assessment, we focused on the following reforms: (i) the transformation of PIDs into decentralized PIDAs and AWBs that have the potential to become operationally autonomous, effective, financially viable, and professionally managed; (ii) the establishment of FOs and the transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs; (iii) the involvement of the private sector in the

carrying out of O&M through Performance Contracts; (iv) the redefinition of the operating jurisdictions of the various institutions in the water sector; and (v) the establishment of water rights and formation of water markets in project-affected areas.

The NDP reforms can be divided roughly into four hierarchical categories: (1) reforms at the national sector planning level, (2) reforms at the federal (WAPDA) executing level, (3) reforms at the provincial planning and executing level, and (4) reforms at the on-farm drainage level. To keep the analysis manageable, we selected a subset of five reforms which are of greater analytical interest. These reforms are described in Matrix 1 below. The number of players is also relatively large. Groups and individuals affected by the reforms, and in the position to affect the outcome of the reforms, include, for example the Government of Pakistan, its leaders and agencies, WAPDA, provincial governments and their leaders and agencies, local organizations, the media, affected officials, farmers' groups, and ordinary farmers. [A complete list of the players involved can be found in World Bank (1997).] Even within each group, there are either different subgroups or individuals that should be considered separately. For example, different parts and individuals in WAPDA may have opposing interests and abilities in affecting the outcome of various reforms. Big farmers and small farmers have different roles and should also be treated separately. With the exception of the farming community, which we divided into "big" and "small" farmers, we categorized all other organizations and groups in the analysis as representing one point of view. The players we considered for the analysis are mentioned in Table 1, and their interaction with the reforms is explained also in Matrix 1.

#### **HOW THE PLAYERS COULD AFFECT THE REFORMS**

There are a variety of means by which parties may affect reforms. Each party may prefer a subset of means based on their relative effectiveness and cost. We describe the means by which potential players might influence the various reforms in Matrix 2 below. It should be noted that it is possible that two players using similar vehicles to influence the reforms' achievement levels may end up having different actual impacts.

Table 1: The major players associated with the water and drainage reforms in Pakistan

| <b>Player's Abbreviation</b> | <b>Player's Description</b>                                              |
|------------------------------|--------------------------------------------------------------------------|
| AWBs                         | Area Water Boards                                                        |
| FOs                          | Farmer Organizations                                                     |
| I&D                          | Irrigation and Drainage                                                  |
| O&M                          | Operation and Maintenance                                                |
| PADs                         | Provincial Agriculture Departments                                       |
| PFDs                         | Provincial Finance Departments, Revenue Depts., Law Depts., Audit Depts. |
| PIDs                         | Provincial Irrigation Departments                                        |
| PIDAs                        | Provincial Irrigation and Drainage Authorities                           |
| WAPDA                        | Water and Power Development Authority                                    |

#### **COST OF INFLUENCING REFORMS' LEVEL OF ACHIEVEMENT**

Matrix 3 below describes the cost to the various parties of impacting the reform achievement levels. The matrix reveals several interesting features. First, the cost or effort level and the level of reform achievement would, in general, be directly correlated for a party which supports the reform (i.e., the cost or effort required by this party would progressively increase in order to achieve a higher level of reform progress). Correspondingly, the cost or effort level and level of reform achievement would, in general be inversely correlated for a party which opposes the reform (i.e., the cost or effort required by this party would progressively increase in order to reduce the level of reform progress). Second, a party which is a passive supporter or opponent of a reform would have to incur a high cost to influence the reform achievement level. This is because this party has several other responsibilities and interests. The time and effort devoted to the reforms has a high opportunity cost. Also in case of small farmers, the cost and effort involved in organizing them into groups which could actively influence the reform levels are very high. Third, some reforms such as the establishment of water rights and the formation of water markets are of a complicated nature and require a number of actions for their implementation. Therefore, such reforms involve very high cost/effort by the supporters for success, and very little cost/effort by the opponents for failure.

## LEVEL OF ACHIEVEMENT

Matrix 4 presents a measure of the reforms' achievement level, based on the variety of actions and the cost associated with the players' attempt to influence the reform. As mentioned earlier, we measured achievement both in terms of fulfillment of the reform components and the time frame needed for such achievement.

## THE DELPHI PROCESS

We provided the information in the tier one procedure (Matrices 1-4) to a panel of 12 experts familiar with the water and drainage sectors in Pakistan; whom we selected from from the development finance agencies sponsoring the project and from other international agencies. We did not select experts from any of the interest groups associated with the reforms. We asked each expert to assign a range of probabilities to each of three possible reform achievement levels, based on the scales of achievement and a set of likelihood values that were presented before.

Only 7 experts responded to the questionnaire. In the first round of the Delphi process, we asked the participants to fill in Matrix 5 below with probabilities for three reforms achievement levels. We analyzed the results of the first round (Table 2), and found that the coefficients of variation (CV) for reforms 1 and 2 were relatively high (>50 percent).<sup>8</sup> Therefore, we initiated a second round of the Delphi process for reforms 1 and 2 only. The second round of the Delphi process yielded CV values below 50 percent (Table 3), which replaced the values reported for reforms 1 and 2 in Table 2.

Table 2: Probabilities assigned to reforms' achievement levels, and CV values, Round 1, All reforms

| Reform      | 1     |       |       | 2     |       |       | 3     |       |       | 4     |       |       | 5     |       |       |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|             | Low   | Med   | High  |
| Probability | 1.428 | 2.857 | 1.714 | 2.000 | 2.285 | 2.000 | 1.428 | 2.857 | 2.142 | 2.428 | 2.000 | 1.142 | 1.571 | 2.428 | 1.571 |
| CV          | 0.509 | 0.291 | 0.513 | 0.654 | 0.450 | 0.534 | 0.509 | 0.291 | 0.388 | 0.372 | 0.267 | 0.306 | 0.463 | 0.372 | 0.463 |

Note: Probability values are 1  $\equiv$  0-25%; 2  $\equiv$  25-50%; 3  $\equiv$  50-75%; 4  $\equiv$  75-100%

<sup>8</sup> Woudenberg (1991) suggest a 50 percent value for repeating the Delphi process in public sector studies.

Table 3: Probabilities assigned to the reforms' achievement levels, and CV values, Round 2, Reforms 1 and 2

| Reform      | 1     |        |       | 2     |        |       |
|-------------|-------|--------|-------|-------|--------|-------|
|             | Low   | Medium | High  | Low   | Medium | High  |
| Probability | 1.285 | 2.857  | 1.571 | 1.428 | 2.428  | 1.571 |
| CV          | 0.351 | 0.291  | 0.463 | 0.346 | 0.372  | 0.463 |

Note: Probability values are 1  $\equiv$  0-25%; 2  $\equiv$  25-50%; 3  $\equiv$  50-75%; 4  $\equiv$  75-100%

We present the consolidated values from the Delphi process in Table 4. The values should be read in the following way: For example, for reform 1, a low achievement level was assigned a (low +) probability, a medium achievement level was assigned a (high -) probability, and a high achievement level was assigned a (medium -) probability. Reform 3 was assigned the highest probability, and reform 4 was assigned the lowest probability for high achievement level. Reform 4 was also assigned the highest probability for the low achievement level.

Table 4: Final Delphi probability values of reforms' achievement levels

| Reform           | 1   | 2   | 3   | 4   | 5   |
|------------------|-----|-----|-----|-----|-----|
| Low achievement  | 1.3 | 1.4 | 1.4 | 2.4 | 1.6 |
| Med Achievement  | 2.9 | 2.4 | 2.9 | 2.0 | 2.4 |
| High Achievement | 1.6 | 1.6 | 2.1 | 1.1 | 1.6 |

Note: Probability values are 1  $\equiv$  0-25%; 2  $\equiv$  25-50%; 3  $\equiv$  50-75%; 4  $\equiv$  75-100%

## DISCUSSION

As is the case in many reforms, information on the political parameters of the various interest groups is not available to policy makers so that they can evaluate the likelihood of success of the proposed reforms. A Delphi process, as suggested in this paper, may provide a sound mechanism to address such data needs. There are several questions, however, that should be addressed in generalizing the results of this study. First, is the policy maker better off when possessing the information provided by the Delphi approach? Second, to what extent does the

composition of experts affect the results of the Delphi approach? And third, should the Delphi approach be used repeatedly over the reform implementation process?

The answers to the above questions depend on whether or not there is another alternative available for the same purpose, and on the alternative cost associated with reform failure or partial achievement. The Delphi approach is based on the best information available, and provides direct assessment (and not proxies) of political risks. Therefore, they should provide policy makers with a sound estimate of political risk. However, and this is also an answer to the second question, the design of the experts sample is critical. To prevent bias in the assessment, the experts sample should carefully be assembled (as is the case with many other sampling issues in statistical analyses). Instructions for Delphi respondents can be found in literature that documents the application of the technique. Finally, as was suggested by one of our reviewers, the Delphi process could be used repeatedly over the course of the reform implementation. This may provide the trend of the implementation likelihood of the reform. The design of a repeated Delphi process should be the subject of a different study.

In assessing the political risk associated with the process of institutional reforms in the water and drainage sector in Pakistan, we assumed several simplifying assumptions with regard to both the reforms and the players. We selected a subset of significant institutions, and focused on major players. Assuming that the reforms are independent of each other allowed us to focus on each reform separately.

The results of the political risk assessment suggest that:

- Reform 1 (Transformation of PIDs into autonomous PIDAs and AWBs) has high chances for medium and high achievement levels.
- Reform 2 (Transfer of responsibilities for management of the systems at the minor and distributary level and small drains to FOs) has medium chances for medium and high achievement levels.
- Reform 3 (Performance contracts awarded to the private sector for carrying out O&M of I&D infrastructure) has very high chances for medium and high achievement levels.
- Reform 4 (Establishment of water rights and formation of water market) has very high chances for low and medium achievement levels.

- Reform 5 (Defining the operational jurisdictions of various institutions in the water sector) has medium chances for low, medium and high achievement levels.

The nature of the reforms is such that each of the individual reforms, if implemented, would provide benefits of their own. Therefore, although there are inter-linkages among the various reforms, implementation could be phased wherever necessary. The sequencing of the reforms could take into the account the relative cost and chances of achievement i.e., reforms that have a high chance of achievement or those in which the level of achievement is potentially high could be implemented early on, and those that have a low chance of achievement or in which the level of achievement is potentially low could be sequenced later in the reform process, after some initial pilots and studies have been carried out.

## **ANNEX: RISK MITIGATION AND MANAGEMENT**

Given the results estimating the project's political risks, it is possible to prepare a risk mitigation and management strategy, that will allow the project sponsors to address risk events when and where they occur.

### **RISK-MITIGATION**

Demonstration of strong political commitment and leadership by the Federal Government, Provincial Governments, and WAPDA to follow through with the institutional reforms, especially regarding decentralization and management transfer of the irrigation and drainage system is crucial to mitigating this risk. So far, this has been forthcoming. The ownership for the reforms at the highest levels is strong especially since the institutional reform strategy was formulated by the Federal Government based on its assessment of the reforms' likely ownership by the people of Pakistan and chances of success in Pakistan's environment. The reform program was first endorsed at the highest political levels on August 19, 1995 (at a meeting involving the President, Prime Minister, the four Provincial Chief Ministers, Cabinet officials, and Secretaries from the Borrower and all the four Provinces, including politicians, organized farmer groups, Chambers of Agriculture, Provincial Departments, etc.); and has been repeatedly re-endorsed at similar levels on several occasions by three successive Governments (Federal and Provincial) since then, sometimes in the face of mounting opposition from organized groups (notably large landholders, feudal landlords, and some officials of PIDs). The federal and Provincial Governments have engaged in extensive consultations with the various stakeholders (including politicians, organized farmer groups, Chambers of Agriculture, Provincial Departments, etc.) to build consensus and win acceptance of the reform program, including on the PIDA Acts. The political and wide-ranging support for the reform program was most recently demonstrated in the enactment of the PIDA Ordinance by all the four interim Provincial Governments (January, 1997) and the reenactment of the PIDA Ordinances as PIDA Acts by the Assemblies thereafter (July, 1997). The extensive debate on the reform strategy, wide-ranging consultations, and the resulting education about the reforms have lowered the perceived threats

of the reforms to a large degree. The risk mitigation strategy is: (i) to continue to encourage political debate about irrigation policy in Pakistan, and thereby help build both conscious top-level political ownership and widespread support among the various stakeholders for the reform program; (ii) strengthen the constituency for reforms through extensive technical assistance, communication and beneficiary participation programs; and (iii) establish institutional focal points in the Federal Government, WAPDA, and Provincial Governments and provide technical assistance to create the necessary incentives and mandates, and equip them with the resources/capacity to function as agents for institutional change.

With respect to the risk of slow or imperfect formation of FOs, the risk-mitigation factors are as follows: (i) the most important factor mitigating this risk is the expected encouragement from positive results of on-going pilots of FOs. These pilots would also help to reduce the perceived threats to the interests of the opponents of reforms in the sector. The early results from these pilot projects indicate that FOs are socially viable i.e., with appropriate social engineering techniques, it is possible to form user groups in the prevailing socio-cultural and political environment. The pilots have also identified a need for these user groups to be empowered and authorized to carry out economic activities i.e., to manage the tertiary level system (IIMI, 1997). The project's farmer participation plan includes a special effort to replicate lessons from current pilots, and to implement early action plans to build FOs; (ii) the selection criteria for Investment Projects in NDP provides built-in incentives for formation of FOs (since the selection criteria specifies that on-farm drainage and irrigation up to the minor/ distributary level would be carried out by FOs); (iii) social mobilization activities and awareness initiatives, the front-end cost-sharing arrangements for investments (which would necessarily require consultation with beneficiaries), and assistance to the private sector for providing contracting services for on-farm subsurface drainage facilities, would facilitate formation of FOs; and (iv) the PIDA Acts clearly define the roles and responsibilities of FOs which include the management of the tertiary system.

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**Matrix 1: INSTITUTIONAL REFORMS IN PROVINCES - POTENTIAL WINNERS AND PERCEIVED LOSERS**

| Reforms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Present Situation                                                                                                                                                                                                                                                                                                                                                                                                                                             | Potential Winners                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Perceived Losers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(1) Transformation of PIDs into autonomous PIDAs and AWBs.</b><br/>This would include:</p> <p>a) Linking of revenues and expenditures (hitherto, the PIDs were only concerned about the expenditures).</p> <p>b) Achievement of financial self-sustainability within stipulated period</p> <p>c) Cost reduction including possible reduction in staffing</p> <p>d) Revenue enhancement through increase in user charges, broadening of the charge include urban and industrial users, etc.</p> <p>e) Financial transparency.</p> <p>f) Corporate governance.</p> <p>g) Transparency in water allocation and distribution.</p> | <p><b>PIDs:</b></p> <p>a) No linkage between expenses and revenues of PIDs</p> <p>b) Funded fully by the state, No financial self-sustainability.</p> <p>c) Financial health dependent only on increased water charges.</p> <p>d) Revenues are collected only from the agricultural sector.</p> <p>e) No transparent or published accounts; Not tested for financial health.</p> <p>f) Non-existent</p> <p>g) No water allocation and distribution rules.</p> | <p><b>PFDs:</b> Fiscal savings through reduction in subsidy to the I&amp;D sector.</p> <p><b>Federal Government:</b> (a) Fiscal savings through reduction in costs on drainage; (b) Long-term financial sustainability of the I&amp;D system.</p> <p><b>Large Farmers:</b> Direct beneficiaries of any efficiency gains (e.g.: through better operation and maintenance of the irrigation and drainage infrastructure, cost reduction).</p> <p><b>Small Farmers:</b> Direct beneficiaries of any efficiency gains (e.g.: through better operation and maintenance of the irrigation and drainage infrastructure, cost reduction).</p> | <p><b>PIDs:</b> The transformed PIDs would face a hard budget constraint, have to be more accountable, face greater financial scrutiny (due to greater transparency requirements), would have to cut costs and possibly reduce staffing, and would have to raise more revenues.</p> <p><b>Large farmers/landlords:</b> (a) In the current system, they have good control over the PIDs. The playing field would now change; (b) They would possibly have to pay more for water - they currently get it for a very low price.</p> <p><b>Provincial Revenue Departments:</b> They are currently in charge of revenue collection. This function would now devolve to the PIDAs and AWBs.</p> |

| Reforms                                                                                                                                  | Present Situation                                                                                                                                                                              | Potential Winners                                                                                                                                                                                                                                                                                                                                                                                                                    | Perceived Losers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs.</b></p> | <p>Water distribution and drainage systems are managed by the irrigation department of the provincial government. FOs have no responsibilities beyond participating in canal construction.</p> | <p><b>Small Farmers:</b> FOs would help in more equitable distribution of water, and sharing of the benefits of irrigation and drainage.</p> <p><b>PFDs:</b> Fiscal savings since these costs are now borne from the state budget.</p> <p><b>PADs:</b> They are involved in formation of Water Users' Associations (which are similar to FOs, but with limited functions) and see a big role for themselves in formation of FOs.</p> | <p><b>Large Farmers:</b> Formation of FOs and the transfer of responsibilities to FOs would result in loss of control over the I&amp;D system. This would result in change in the social structure (feudal system) over which they have traditional control.</p> <p><b>WAPDA:</b> Loss of the responsibilities for carrying out on-farm drainage (tubewells, tile drains, etc.).</p> <p><b>PIDAs and AWBs:</b> (a) Reduction in their role in management of the irrigation infrastructure at this level; (b) Reduced rent-extraction opportunities since they will be dealing with communities rather than individual farmers.</p> <p><b>Provincial Revenue Departments:</b> They are currently in charge of revenue collection. This function would now devolve to FOs.</p> <p><b>PADs:</b> Their role in carrying out civil works (watercourses) would be reduced.</p> |

| Reforms                                                                                                                   | Present Situation                                                                                                                      | Potential Winners                                                                                                                                                                                                                                                                                                                                                                                                                                     | Perceived Losers                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(3) Performance Contracts Awarded to the private sector for carrying out O&amp;M of I&amp;D infrastructure.</b></p> | <p>Done by provincial government departments through hiring of existing staff (overtime), and purchase of special equipment.</p>       | <p><b>Business Community (Contractors):</b> Increased business opportunities since these works are now being directly executed by the PIDs.</p> <p><b>Farming Community:</b> Better operating I&amp;D system (since today they suffer the impact of the non-operating I&amp;D infrastructure).</p> <p><b>PIDAs and AWBs:</b> Reduction in costs since the private sector can carry out the works more efficiently and in a cost-effective manner.</p> | <p><b>PIDAs and AWBs:</b> Today these works are carried out by the PIDs (although not carried out efficiently or fully). This helps the PIDs to justify their staff strength and expenditure.</p>                                                                                                                                                              |
| <p><b>(4) Establishment of water rights and formation of water markets.</b></p>                                           | <p>Water trading between water courses is prohibited. Water rights exist through <i>Warabandi</i>, but not enforced.</p>               | <p><b>Small farmers:</b> (a) water rights would be much more clearly defined; (b) water trading would be legitimized.</p>                                                                                                                                                                                                                                                                                                                             | <p><b>Large farmers:</b> Loss of the control which they today command (because rights are not clearly defined now).</p>                                                                                                                                                                                                                                        |
| <p><b>(5) Defining the operational jurisdictions of various institutions in the water sector.</b></p>                     | <p>WAPDA and provincial PIDs through ad-hoc distribution of responsibilities handle development and operation of the water sector.</p> | <p><b>PIDAs and AWBs:</b> They would now have operational jurisdiction over intra-provincial drainage functions, which hitherto were carried out by WAPDA.</p>                                                                                                                                                                                                                                                                                        | <p><b>WAPDA:</b> Today it has full jurisdiction over drainage throughout the country, and over inter-provincial irrigation infrastructure. The redefined role would force WAPDA to move away from large-scale construction role, and change to a 'knowledge management' role, and construction and management of inter-provincial irrigation and drainage.</p> |

Note: PIDs will transform to PIDAs and AWBs after the first reform will take place. At the time of publication of this paper PIDs have already been transformed into PIDAs. The AWBs will be established in each province on canal commands one year after enactment of the PIDA Acts.

**Matrix 2: ACTIONS TAKEN BY INTEREST GROUPS FOR AND AGAINST THE REFORMS**

| Reform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Means by which Parties Affect Reform Achievement Levels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(1) <b>Transformation of PIDs into autonomous PIDs and AWBs.</b> This would include:</p> <p>a) Linking of revenues and expenditures (hitherto, the PIDs were only concerned about the expenditures).</p> <p>b) Achievement of financial self-sustainability within stipulated period</p> <p>c) Cost reduction including possible reduction in staffing</p> <p>d) Revenue enhancement through increase in user charges, broadening of the charges includes urban and industrial users, etc.</p> <p>e) Financial transparency</p> <p>f) Corporate Governance</p> <p>g) Transparency in water allocation and distribution.</p> | <p><b>Federal Government:</b> (a) cajoling Provinces; (b) holding out 'carrot' of donor funds (and coercing them about risk of loss of donor funds if reforms are not implemented); (c) presidential involvement - invoking Presidential directives and persuasion; (d) promoting interest groups in favor of reform; (e) providing advice and technical assistance support; (f) providing co-ordination function.</p> <p><b>PIDs:</b> (a) indulging in bureaucratic delay tactics and stalling including continuous whittling down of reform proposals at various stages; (b) providing misinformation to political bosses; (c) collaborating with opponents notably large landlords; (d) providing misinformation in media.</p> <p><b>PFDs:</b> Passive support to reforms since this is only one of their several responsibilities and interests, lack of time and energy to devote to the reform process.</p> <p><b>PRDs:</b> Passive opposition to reforms since this is only one of their several responsibilities and interests.</p> <p><b>Large farmers:</b> (a) providing mis-information in media; (b) providing misinformation to politicians with whom they carry lot of influence; (c) collaborating with other opponents notably PIDs.</p> <p><b>Small farmers:</b> Passive players (in the absence of concerted efforts to get them organized and involved). Not much influence because of lack of organization, understanding of issues, and means to participate and influence reforms.</p> |

| <b>Reform</b>                                                                                                                            | <b>Means by which Parties Affect Reform Achievement Levels</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs.</b></p> | <p><b>Federal Government:</b> (a) providing co-ordination function; (b) persuading other players.</p> <p><b>PIDAs and AWBs:</b> (a) indulging in bureaucratic delays and stalling tactics; (b) indulging in obstruction tactics (such as blocking off water to distributaries or minors); (c) providing misinformation to political bosses including creating fear that the I&amp;D system would degenerate because of lack of O&amp;M.</p> <p><b>PADs:</b> (a) showing positive results from early pilots; (b) carrying out active social mobilization efforts to form FOs; (c) using experience from watercourse improvement activities and expand these activities.</p> <p><b>WAPDA:</b> (a) not providing technical assistance and information in areas of expertise such as tile drains; (b) 'crowding out' - not providing opportunity for FOs to carry out these activities.</p> <p><b>PFDs:</b> Passive support since this is only one of their several responsibilities.</p> <p><b>Large farmers:</b> (a) using existing social power-hold to frustrate social mobilization efforts and prevent formation of FOs; (b) providing misinformation to political friends; (c) providing misinformation in media.</p> <p><b>Small farmers:</b> Passive players (in the absence of concerted efforts to get them organized and involved). Not much influence because of lack of organization, understanding of issues, and means to participate and influence reforms.</p> |

| Reform                                                                                                                    | Means by which Parties Affect Reform Achievement Levels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(3) Performance Contracts Awarded to the private sector for carrying out O&amp;M of I&amp;D infrastructure.</b></p> | <p><b>Federal Government:</b> (a) providing co-ordination function; (b) persuading other players.</p> <p><b>PIDAs and AWBs:</b> (a) indulging in bureaucratic delays and stalling tactics; (b) creating procurement delays; (c) questioning cost-effectiveness of this arrangement; (d) questioning competence of contractors to carry out O&amp;M; (e) providing arguments that they have existing capacity which would be wasted.</p> <p><b>PFDs:</b> Passive players since they do not get involved in details of I&amp;D operations.</p> <p><b>Large farmers:</b> Passive players since they are not very interested in the operational aspects of PIDAs and AWBs.</p> <p><b>Small farmers:</b> Passive players (in the absence of concerted efforts to get them organized and involved). Not much influence because of lack of organization, understanding of issues, and means to participate and influence reforms.</p> <p><b>Contractors:</b> Limited influence on policy decisions such as contracting out to the private sector.</p> |
| <p><b>(4) Establishment of water rights and formation of water markets.</b></p>                                           | <p><b>Federal Government:</b> (a) providing co-ordination function; (b) carrying out of studies; (c) persuading other players.</p> <p><b>PIDAs and AWBs:</b> (a) providing mis-information to political bosses; (b) providing misinformation in media; (c) creating scare about privatization of water; (d) frustrating efforts to develop physical infrastructure required.</p> <p><b>Large farmers:</b> (a) providing mis-information to political friends; (b) providing misinformation in media; (c) creating scare about privatization of water.</p> <p><b>Small farmers:</b> Passive players (in the absence of concerted efforts to get them organized and involved). Not much influence because of lack of organization, understanding of issues, and means to participate and influence reforms.</p>                                                                                                                                                                                                                                  |

| <b>Reform</b>                                                                                         | <b>Means by which Parties Affect Reform Achievement Levels</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(5) Defining the operational jurisdictions of various institutions in the water sector.</b></p> | <p><b>Federal Government:</b> (a) issuing directives; (b) persuading other players; (c) providing co-ordination function; (d) stopping approval and funding of schemes which do not come within the agreed operational jurisdiction framework.</p> <p><b>PIDAs and AWBs:</b> (a) demonstrating ability to carry out increased responsibilities in selected areas; (b) bringing political pressure through Provincial politicians.</p> <p><b>WAPDA:</b> (a) continuing to prepare and execute projects outside its operational jurisdiction; (b) creating doubts about capability of PIDAs, AWBs and FOs to carry out their functions.</p> |

**Matrix 3: COST TO PARTIES, OF IMPACTING REFORMS' ACHIEVEMENT LEVEL**

Here we refer to the cost to a party (such as Small farmers) that supports/opposes a given reform. For example, to the Federal Government to support a Low (L), Partial (P), and Full (F) achievement rates of reform 1 (Transformation of PIDs...) it takes Small (S), Medium (M), and High (H) cost, respectively.

| Reform                                                                                                                     | Cost to the Parties of Impacting Reform Achievement Levels |   |   |      |   |   |                |   |   |       |   |   |      |   |   |      |   |   |      |   |   |               |   |   |               |   |   |             |   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---|---|------|---|---|----------------|---|---|-------|---|---|------|---|---|------|---|---|------|---|---|---------------|---|---|---------------|---|---|-------------|---|
|                                                                                                                            | Federal Govt.                                              |   |   | PIDs |   |   | PIDAs and AWBs |   |   | WAPDA |   |   | PFDs |   |   | PADs |   |   | PRDs |   |   | Large Farmers |   |   | Small Farmers |   |   | Contractors |   |
| Cost (Small, Medium, High) Associated with Impact on Various Reform Achievement Levels (Low, Partial, Full)                |                                                            |   |   |      |   |   |                |   |   |       |   |   |      |   |   |      |   |   |      |   |   |               |   |   |               |   |   |             |   |
| Reform Achievement Level →                                                                                                 | L                                                          | P | F | L    | P | F | L              | P | F | L     | P | F | L    | P | F | L    | P | F | L    | P | F | L             | P | F | L             | P | F |             |   |
| (1) Transformation of PIDs into autonomous PIDAs and AWBs; and associated reforms                                          | S                                                          | M | H | M    | S | S |                |   |   |       |   |   | S    | H | H |      |   |   | S    | H | H | S             | S | H | H             | H |   |             |   |
| (2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs. | S                                                          | M | H |      |   |   | M              | M | S | H     |   | S | H    | H | H | S    | M | H | H    | H | H | S             | S | H | H             | H |   |             |   |
| (3) Performance Contracts Awarded to the private sector for carrying out O&M of I&D infrastructure.                        | S                                                          | S | M |      |   |   | H              | M | S |       |   |   | H    | H | H |      |   |   |      |   |   | M             | H | H | H             | H | M | H           | H |

|                                                                                         |   |   |   |  |  |  |   |   |   |   |   |  |  |  |  |  |  |  |   |   |   |   |   |   |  |  |  |
|-----------------------------------------------------------------------------------------|---|---|---|--|--|--|---|---|---|---|---|--|--|--|--|--|--|--|---|---|---|---|---|---|--|--|--|
| (4) Establishment of water rights and formation of water markets.                       | S | H | H |  |  |  | S | S | S |   |   |  |  |  |  |  |  |  | S | S | S | H | H | H |  |  |  |
| (5) Defining the operational jurisdictions of various institutions in the water sector. | S | M | H |  |  |  | S | M | H | M | S |  |  |  |  |  |  |  |   |   |   |   |   |   |  |  |  |

Notes: (a) Blank cells mean that the player is not significantly affected by the reform (See also Matrix 1)

(b) PIDs will transform to PIDAs and AWBs after the first reform takes place, and hence cells for PIDs are blank after first reform.

**Matrix 4: REFORMS ACHIEVEMENT LEVELS**

| Reform                                                                                                                       | Reform Achievement Level                                                                                                        |                                                                                                                                      |                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                              | High/Full                                                                                                                       | Medium/Partial                                                                                                                       | Low/Failure                                                                                                                         |
| (1) Transformation of PIDs into autonomous PIDs and AWBs. This would include:                                                |                                                                                                                                 |                                                                                                                                      |                                                                                                                                     |
| a) Linking of revenues and expenditures (hitherto, the PIDs were only concerned about the expenditures).                     | Revenues and expenditures accrue to the same entity.                                                                            |                                                                                                                                      | Revenues and expenditures accrue to separate entities (e.g.: water charges accrue to the general treasury rather than to the PIDA). |
| b) Achievement of financial self-sustainability within stipulated period                                                     | Subsidy to PIDs and AWBs for recurrent expenditures reduced to zero in 10 years; and subsidy to FOs reduced to zero in 7 years. | Subsidy to PIDs and AWBs for recurrent expenditures not reduced to zero in 20 years; and subsidy to FOs reduced to zero in 15 years. | Subsidy to PIDs, AWBs and FOs remains at current levels, and may even increase.                                                     |
| c) Cost reduction including possible reduction in staffing                                                                   | Cost reduction of 3% per year in real terms from current levels.                                                                | No cost reduction- Costs remain the same in real terms.                                                                              | Costs increase in real terms by 1% and above per year.                                                                              |
| d) Revenue enhancement through increase in user charges, broadening of the charges includes urban and industrial users, etc. | Increase in revenues of 15% p.a. (real terms).                                                                                  | Increase in revenues of 10% p.a. (real terms)                                                                                        | Increase in revenues by 0-5% p.a. (real terms).                                                                                     |
| e) Financial transparency                                                                                                    | Full disclosure of financial position, accounts according to generally accepted standards.                                      | Accounts maintained on commercial basis, but not adhering to generally accepted standards, partial disclosure.                       | Accounts maintained on government accounting basis; no disclosure.                                                                  |

| Reform                                                                                                                     | Reform Achievement Level                                                                                                                                                                                                                |                                                                                                                                                                              |                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                            | High/Full                                                                                                                                                                                                                               | Medium/Partial                                                                                                                                                               | Low/Failure                                                                                                                                                                                                                |
| f) Corporate Governance                                                                                                    | Full separation of ownership from management. No government interference in internal management of PIDAs, AWBs and FOs including appointment of key staff. Government compensates PIDAs, AWBs and FOs for any mandates imposed on them. | Separation of ownership from management. Government interference in some internal matters such as staffing, pricing, etc.; but compensates for any mandates imposed on them. | Government interferes in internal management of the PIDAs, AWBs and FOs. Government procedures apply for the internal working of the PIDAs, AWBs and FOs. Government does not compensate for any mandates imposed on them. |
| g) Transparency in water allocation and distribution.                                                                      | Information is systematically and properly collected, analyzed and publicly disclosed.                                                                                                                                                  | Lack of systematic collection and analysis; but available information is disclosed.                                                                                          | No collection of data on water distribution and allocation, or no disclosure of available information.                                                                                                                     |
| (2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs. | FOs established and take over 100% of minors and distributaries and small drains in 10 years.                                                                                                                                           | FOs established and take over 50% of distributaries and minors and small drains in 10 years; 100% in 20 years.                                                               | Very slow formation of FOs. Only few and isolated pilots.                                                                                                                                                                  |
| (3) Performance Contracts Awarded to the private sector for carrying out O&M of I&D infrastructure.                        | O&M carried out through contracts awarded to private sector in 50% of total area in 5 years; and 100% in 10 years.                                                                                                                      | O&M in 25% of area carried out through contracts awarded to private sector in 5 years; and 50% in 10 years                                                                   | O&M carried out through force-account by PIDAs and AWBs.                                                                                                                                                                   |
| (4) Establishment of water rights and formation of water markets.                                                          | Water rights established and water markets fully functioning in 15 years (at watercourse and canal command level). Necessary legal and regulatory framework in place.                                                                   | Trading in water legalized. No formal water rights and water markets; but informal trading allowed and takes place within and between watercourses.                          | No steps taken for establishment of water rights and water markets.                                                                                                                                                        |

| Reform                                                                                  | Reform Achievement Level                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                          |                                                                                                                                        |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                         | High/Full                                                                                                                                                                                                                                             | Medium/Partial                                                                                                                                                                                                                                           | Low/Failure                                                                                                                            |
| (5) Defining the operational jurisdictions of various institutions in the water sector. | Agreed operational jurisdictions are fully followed. WAPDA gets out of construction and O&M of on-farm and intra-provincial drainage. AWBs are established in all canal commands and are responsible for intra canal command irrigation and drainage. | Formal division of operational jurisdictions established. However, not fully followed in practice. Some adhoc arrangements established for specific areas/schemes. Very few AWBs established - activities under their jurisdiction carried out by PIDAs. | No clear division of operational jurisdictions. WAPDA still involved in construction and O&M of on-farm and intra-provincial drainage. |

**Matrix 5: PROBABILITIES OF REFORMS' ACHIEVEMENT LEVELS**

Given the information in Matrixes 1-4, the experts selected for the Delphi process on the basis of their familiarity with the water and drainage politics in the country, provide their subjective estimate of the probability of level (Low, Partial, Full) of reform achievement.

To simplify the analysis, they were asked to refer to the following range of probabilities:

- (1) 0-25;
- (2) 25-50;
- (3) 50-75;
- (4) 75-100.

For example, taking the first reform, one's subjective estimate is that a Low achievement level is 50-75% likely to happen; a Partial achievement level is 25-50% likely to happen; and a Full achievement level is 0-25% likely to happen.

Note: the horizontal sum over the probabilities in the three cells of each reform may exceed 100%.

| Reform                                                                                                                     | Reform Achievement Level      |         |      |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------|------|
|                                                                                                                            | Low                           | Partial | Full |
|                                                                                                                            | Probability of Occurrence (%) |         |      |
| (1) Transformation of PIDs into autonomous PIDAs and AWBs; and associated reforms                                          |                               |         |      |
| (2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs. |                               |         |      |
| (3) Performance Contracts Awarded to the private sector for carrying out O&M of I&D infrastructure.                        |                               |         |      |
| (4) Establishment of water rights and formation of water markets.                                                          |                               |         |      |
| (5) Defining the operational jurisdictions of various institutions in the water sector.                                    |                               |         |      |

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