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Politics of institutional reforms in the water and drainage sector of Pakistan

ARIEL DINAR
World Bank, Agriculture and Rural Development Dept, Room MC 5-717, 1818 H St. NW, Washington DC 20433, USA.

TRICHUR K. BALAKRISHNAN
World Bank, South Asia Rural Development Unit.

JOSEPH WAMBIA
World Bank, Internal Audit Department.

ABSTRACT. This paper develops an approach to assess the political risk associated with implementation of institutional reforms in the water sector, while providing insights into the interrelationship of institutional arrangements, power structure, and policy outcome. The analytical approach consists of a two-tier process to assess the institutional feasibility of reform implementation. The first tier is a structured analysis of power distribution among the power groups interested in the outcome of the reform. The second tier is a Delphi process, reflecting the opinions of experts. The approach was applied to the case of the National Drainage Program Project (NDP) in Pakistan, currently in the early stages of implementation. Several hypotheses regarding likely progress were tested, using the feedback provided by a panel of experts in the Delphi process.

1. Introduction

There has been an increased emphasis on institutional reforms in development projects in the water and environment sectors in many countries in recent years. The reforms have been prompted by several factors, including increased awareness regarding water scarcity and the environmental impacts of irrigation and drainage. These changes in awareness have caused a fundamental shift from relying on additional construction as a means for meeting the needs for increased water supply, to improving water resource management via institutional reforms of the water sector in various countries (various chapters in Dinar, 2000).

Institutional reforms that result in changes in power and/or benefit distribution inevitably create considerable political opposition because they redistribute welfare (Bromley, 1989). Powerful vested interests may slow,

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divert, or even stop desirable reforms. Therefore, policy makers would benefit from being able to assess the likely outcome of reforms prior to their implementation and to prepare mitigating actions.

The institutional economics 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 *et al.*, 1986; Hamid *et al.*, 1991; Rose-Ackerman and Evenson, 1985; Sturzenegger, 1991). However, very few studies address the political economy of reforms in the water sector (for example, the cited studies in Dinar, 2000; Savedoff and Spiller, 1999; Rinaudo and Tahir, 2003; Dinar, 2003). In addition, to the best of our knowledge, this literature does not provide direct quantitative estimates of political influence and political risks of the reforms.

As Haggard *et al.* (1995) show, interest-group analysis is not straightforward, and differs significantly, depending on the countries analyzed (for example, level of development). Several factors affect the ability to analyze interest group impacts; including: (1) collective action – the ability of groups to organize and influence; (2) identification of exogenous–endogenous reactions to the reform design – that is, the design and the implementation sequence affect the interest group reaction, and (3) identification of mechanisms through which interests are translated into policy – for example, strikes, bribes, etc. Haggard *et al.* (1995) also show that dormant interest groups may become active under certain circumstances; that unexpected coalitions may form under certain circumstances; and that the combination of *a-priori* weak interest groups and certain mechanisms of translating their interests may be very effective, for example, violent demonstrations of the poor.

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 the political influence of interest groups. Empirical studies (for example, Stallings and Brock, 1993; Sturzenegger, 1991) in Chile, and Argentina, illustrated the relative power between potential gainers and losers,[1] who, depending on their relative power, had much less ability to realize their potential gains, or to minimize their losses from various reforms.

Public choice models, as another branch of the literature (for example, Stigler, 1971; Peltzman, 1976; Becker, 1983), help to better understand the process of interactions among interest groups and the likely direction of their influence on the reform outcome. Using slightly different political rationale for pressure group actions (Becker – influence functions; Peltzman – political

[1] The term 'winners and losers' or 'gainers and losers', taken from the political economy literature (for example, Stallings and Brock, 1993: 100; and Bhalla, 1991: 222), is used here in conjunction with parties who may gain more and parties who may gain less from a prospective reform.

support functions), these models could predict which pressure group would gain more from a reform relative to other groups.

During the process of reform design and implementation, and especially in reforms that address more than one issue and involve many stakeholders, policy makers face difficulties in assessing the direction in which the reform will proceed and the likelihood of its success. In most cases, they lack sufficient information and time to collect data and conduct in-depth analysis of the reform prospects. In such situations applications of models (for example, Becker, 1983; Peltzman, 1976) might be difficult. Therefore, policy makers may rely on educated advice, using forecasting techniques such as Delphi to help them evaluate the prospects of the reforms.

In this paper we develop an approach, based on the Delphi technique, to estimate the likelihood of success of institutional reforms, and apply it to a package of reforms in the irrigation and drainage sector of Pakistan. We focus only on a subset of the major institutional reforms and on the major interest groups, and make linkages to the political economy of the irrigation and drainage sector. We conclude by comparing our assessment with actual intermediate progress as of April 2001. We then evaluate the possible use of the approach in politically risky reforms.

2. A framework for estimating political risks of institutional reforms

Decision-making about the future is always a challenge, especially when the knowledge base is narrow and the future time horizon is long. Regulators, politicians, managers, and public officials have been benefiting from the application of the Delphi technique – a widely used instrument to aggregate individual judgments into refined opinion, either to forecast future events, or to estimate current status, intentions, or decisions. A detailed description of and discussion about the Delphi technique can be found in various publications (for example, Linstone and Turoff, 1975a, b; Webler *et al.*, 1991; Kastein *et al.*, 1993).[2]

The Delphi technique relies on a structured, yet indirect, approach to quickly and efficiently elicit responses relating to group learning and forecasting from experts who bring knowledge, authority, and insight to the problem, while, at the same time, promoting learning among panel members. It records facts and opinions of the panelists, while avoiding the pitfalls of face-to-face interaction, such as group conflict and individual dominance (Gupta and Clarke, 1996: 186). The Delphi technique is particularly useful when there is no historical data or when 'ethical or social dilemmas dominate economic or technical ones' (Rowe *et al.*, 1991, cited in Gupta and Clarke, 1996: 187) – which in particular is relevant for the issues analyzed in the present paper.

Several limitations have also been recognized in the application of the Delphi technique. Besides possible poor design, and execution of the process, which might affect the application of any other technique, the Delphi technique is sensitive to selection of panelists that can deliberately promote

[2] A critical review of Delphi applications by sectors between 1975 and 1994 can be found in Gupta and Clarke (1996). An earlier review of the Delphi applications (until 1974) can be found in appendix A in Linstone and Turoff (1975a).

desired outcomes or influence future decisions – making the selection of panelists very important. Another disadvantage of the Delphi technique is that there is no way to assign higher or lower reliability scores to technical panelists compared with lay panelists (Gupta and Clarke, 1996: 187).

The Delphi process exists in 'iterative' and 'almost simultaneous' forms. While the first form consists of a monitoring team that regulates and coordinates the process, the latter one is mechanized (computer, web), and allows real-time responses and updates. However, the Delphi process, in either form, consists of four basic phases: (a) exploration of the subject under consideration, (b) understanding how each panelist views the issue, (c) in case of disagreement, understanding the reasons for such differences, and (d) feedback, final evaluation and consensus.

We draw on a procedure that has been suggested by Raiffa (1982), and is used in association with the Delphi technique (Preble, 1983; Woudenberg, 1991; Buck *et al.*, 1993) to estimate the probabilities of achieving desired reforms.

The procedure consists of several components:

(i) an evaluation of the potential winners and losers from the reforms;
(ii) identification of the various reforms' 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 (that is, effort required by) each party to influence the achievement levels; and
(v) applying the Delphi approach to estimate probabilities of level of achievement of each reform.

A two-tier procedure is proposed (Raiffa, 2000). The first tier (components i–iv) is an evaluation of the process of reform implementation, identifying net gainers and net losers, the parties' objection to and support of each reform, and the cost, to each party, of influencing the reform outcomes. Using information from the first tier, the Delphi technique is applied (component (v)) 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.

2.1. Identification of the players and the reforms

Where the number of players and the number of reforms cannot easily be handled, sub-sets of players and reforms should be selected, in order to ensure a workable set while capturing the essence of the problem. For example, reforms with relatively stable outcomes, and players with little influence could be eliminated from the analysis.

2.2. 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 achievement levels and the time frame for implementation of a particular reform would be affected by active opposition or support; and the actual achievement level will be the outcome

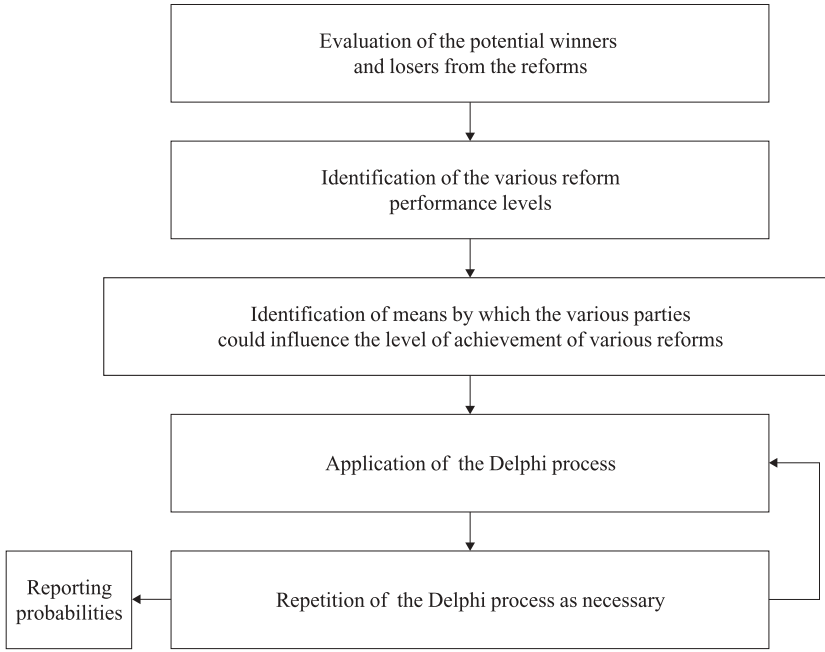

Figure 1. *A process for estimating the political risk associated with institutional reforms.*

of that process.[3] There are various means by which players affect the reforms' implementation. Specifically, some players support or oppose a given reform passively, while some do so actively (Becker, 1983; Haggard *et al.*, 1995; Peltzman, 1976).

2.3. Players' transaction cost of influencing reforms' level of achievement

It can be postulated that players' costs of influencing a reform is a function of their political power, and of the magnitude of change they wish to incorporate into the reform. Players can influence the direction and outcome of reforms by demonstrations, meetings and presentation of their political positions, or simply by financially rewarding policy makers who support their positions.

2.4. 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, one can estimate the achievement levels of a reform in terms of fulfillment of the reform components, and the time frame needed for such achievement. We suggest to use three levels: high/full, medium/partial, and low/failure.

[3] 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.

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2.5. Estimating the likelihood of achievement of the various reforms' levels – the Delphi process

We applied information from the tier-one procedure to a Delphi process (Preble, 1983); and assumed (based on the discussion in the next section) that the reforms were independent of each other, so that implementation of one reform did not necessarily affect the others. Furthermore, we assumed that likelihood of achievement was not continuous, and attached a four-stage value scale to the probability of achieving each level, namely: (1) low 0–25 per cent, (2) medium 26–50 per cent, (3) high 51–75 per cent, and (4) very high 76–100 per cent. We applied the Delphi process and achieved convergence (Woudenberg, 1991) of the coefficient of variation (*CV*) in the second round. We defined convergence as the attainment of an empirically determined level ($CV = 50\%$).[4]

3. Political economy of the irrigation and drainage sector of Pakistan

To appreciate the application of the Delphi procedure to reforms in the irrigation and drainage sector of Pakistan, readers should be familiar with the political economy of that sector, and with the process that brought about the reforms, which we present briefly below. A more detailed description of the sector can be found in Wambia (2000).

3.1. The agrarian economy

An understanding of the country's agrarian economy is essential for a proper realization of the political economy of the irrigation and drainage sector in Pakistan, at least among the various segments of the farming community. Hamid *et al.* (1991) and Nabi *et al.* (1986) provide valuable background information on the agrarian sector of Pakistan. The agrarian sector of Pakistan is characterized by big income distribution differences between different types of agricultural producers. The two main types of agrarian producers are landowners, who are mostly large-scale farmers, and tenants, who conversely are mostly small-scale farmers. Because the two groups/types of farmers benefit differently from various input and output pricing reforms, we postulated that institutional reforms would also benefit them differently.

Nabi *et al.* (1986: 72) argue 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

[4] Woudenberg (1991) suggests a 50 per cent value for repeating the Delphi process in public sector studies.

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with intervention. As predicted, it has been confirmed that large farmers in Pakistan have opposed price reforms in agriculture because they gain more from the status quo in agriculture than the small farmers, who stand to gain more from the proposed reforms. Although small and big farmers in Pakistan are only two of several stakeholders in the irrigation and drainage sector reform, this paper demonstrates how both groups would relate to the proposed institutional reforms under NDP.

3.2. The irrigation and drainage system

Pakistan has the world's largest integrated irrigation network. The system is fed by the Indus River and its tributaries. It draws an average of 106 million acre feet[5] (MAF) of surface water annually for irrigation, supplemented by an annual groundwater volume of some 43 MAF. With nearly 80 per cent of the agricultural land being irrigated, irrigated agriculture contributes significantly to the economy of Pakistan, which accounts for 25 per cent of GDP, 50 per cent of employment, and 70 per cent of export revenues (World Bank, 1997).

Sector status and need for reform

The sector suffers from extensive waterlogging and salinity, over-exploitation of fresh groundwater, low efficiency (in delivery and use), inequitable distribution, poorly funded operation and maintenance (O&M), and poor cost recovery (for irrigation and drainage). Waterlogging and salinity are the principal threats to the sustainability of irrigated agriculture in Pakistan. Salinity robs farmers of about 25 per cent of the potential production of major crops. Due to age, overuse, and poor maintenance, the efficiency of delivery of the canal system is only 35–40 per cent of rated capacity. 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 is a major concern in Pakistan.[6] The poor state of O&M is reflected in the periodic need for rehabilitation at roughly five-year intervals. These problems are rooted in several underlying factors, which characterize Pakistan's agricultural sector, including public sector inefficiencies, structure of the agrarian society, land tenure system, irrigation system design, and political economy resulting from the interplay of all these factors. As in the broader agricultural sector, the development of a functioning market for water and land is essential to eventual resolution of the sector's problems. Institutional and regulatory reforms that facilitate market efficiency and private sector activities are perhaps the most obvious route for implementing these reforms.

The current quest for financial and environmental sustainability of Pakistan's irrigation system started in the mid 1970s, and intensified in the 1980s and into the 1990s. These reforms were supported by financial and technical assistance from Pakistan's development partners. For example, the World Bank supported these reforms through a series of related

[5] 1 acre-foot = 1,235 cubic meters.

[6] See recent work by Rinaudo *et al.*, 2000; Rinaudo, 2003; and Azam and Rinaudo, 2000.

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projects such as the On-Farm Water Management Project I, II, and III; and the Irrigation Systems Rehabilitation Projects (ISRP I and II). Since the early 1980s, the Government of Pakistan (GOP), its Water and Power Development Authority (WAPDA), Provincial Irrigation Departments (PIDs), the array of national and international irrigation research institutes (notably the International Land Reclamation Institute of the Netherlands (ILRI), and the International Water Management Institute (IWMI), and Pakistan's development partners, have been engaged in various initiatives and programs to find long-term solutions to the sustainability of Pakistan's irrigation and drainage system.

Following extensive fieldwork by IWMI (for example, Bandaragoda and Rehman, 1995, and Bandaragoda and Memon, 1997), planning and prolonged dialogue among the key stakeholders, a new strategy for achieving long-term sustainability of Pakistan's irrigated agriculture sector was formulated as part of the NDP project. It seeks to introduce and mainstream a comprehensive approach to River Basin Management (RBM); enhance the knowledge base to adopt sound technical solutions to drainage; and reduce fiscal dependency, especially for on-farm drainage. The strategy, of four inter-linked components, is based on division of roles and responsibilities among the stakeholders, and their participation in the process. A detailed description is provided below.

3.3. Genesis and chronology leading to the reforms

The origin of the reform program, supported under the National Drainage Program (NDP) – that is the focus of this paper – dates back to the 1980s. With support from its development partners and research institutes, GOP and PIDs implemented numerous programs of rehabilitation and institutional reforms at the farm (watercourse) level, and within the PIDs. These efforts included a series of pilot initiatives; numerous reorganizations of public agencies; and initiatives to increase farmers' role in managing the irrigation system. Results from these piecemeal changes were modest, providing an impetus for more comprehensive reforms. Attempts at more intensive reforms first focused attention under the Left Bank Outfall Drain (LBOD) Project in Sindh, which was cofinanced by eight of Pakistan's main development partners[7] and were subsequently extended nationwide under the NDP in 1997.[8]

In 1994, the World Bank released a sector strategy paper, proposing a new approach to tackling the problems of the irrigation and drainage sector in Pakistan, which was agreed with the government (World Bank, 1994). The change of strategy in Pakistan followed closely similar changes in the consensus in the international irrigation community. Leading irrigation countries such as Mexico, Turkey, India, Philippines, Australia, Netherlands, and the United States implemented far-reaching institutional

[7] The World Bank, Asian Development Bank (ADB), United Kingdom's Department for International Development (DFID), Swiss Development Cooperation (SDC), Canadian Agency for International Development (CIDA), Saudi Fund for Development (SFD), the OPEC Fund, and the Islamic Development Bank (IDB).

[8] World Bank (1998).

reforms involving greater decentralization, introduction of tradable water rights, and reduction in the role of government in the irrigation and drainage sector. Similar changes in thinking and strategy also occurred in the donor community, and among water resources research institutions all over the world.[9] The strategy consisted of the following mutually reinforcing, but not inter-dependent, parts:[10] (i) restructuring the PIDs to form Public Utilities (PUs) around canal commands; (ii) actively promoting formation and development of Farmer Organizations (FOs); (iii) strengthening federal agencies, notably WAPDA's Water Wing; and (iv) formalizing water markets and individual water property rights.[11] The GOP and the World Bank recognized at that time that the strategy required strong political commitment and the will to implement real reform in the sector.[12,13]

Political background and impetus

The impetus and nature of institutional reforms in Pakistan's irrigated sector must be understood in the prevailing national and regional (provincial) political context. The high level of political turmoil that has prevailed in Pakistan since the early 1990s led to prolonged negotiations and delayed implementation of NDP reforms. For example, between 1993 and 2001, the GOP, WAPDA, and provincial governments have changed hands and entire leadership teams at least seven times (including three interim administrations which lasted three months each, and the military government which took power in a coup in 1999). In each case, opponents of the reforms that had been supported by the preceding administrations staffed the succeeding administrations. The changes also meant that civil servants were reluctant to implement the agreed reforms, and spent valuable time re-educating their new superiors on the need for, and actual nature of, the reforms. The political factor alone probably explains far more of what has happened to NDP reforms than the nature of the reform program itself.

In 1991, GOP prepared a *National Conservation Strategy* (NCS) (Government of Pakistan, 1991) in collaboration with the Pakistan chapter of the International Union of Nature Conservationists (IUCN), United Nations Development Program (UNDP) and the Canadian International

[9] Pakistan has been an active member of the international irrigation community; and has thus influenced and been influenced by the change of strategy.

[10] See World Bank (1994: 44, para 6.1).

[11] Trading of water would also require irrigation canal systems, which could allow some flexibility in distributing water, and would evolve over the medium and long-term. These would initially be implemented in pilot FO areas.

[12] The public sector has full responsibility for drainage, including on-farm drainage. Drainage systems are constructed by WAPDA. The drainage systems are operated and maintained by PIDs. The public sector also has full responsibility for irrigation up to the outlets to watercourses. Large multipurpose reservoirs and inter-provincial irrigation canals are constructed and maintained by WAPDA. Intra-provincial irrigation canals up to the outlets to watercourses are constructed and maintained by PIDs. Watercourses and field channels are operated and maintained by farmers.

[13] For a detailed description see World Bank (1994).

Development Agency (CIDA), which identified waterlogging and salinity as the principal environmental threat to Pakistan, and a direct threat to the sustainability of Pakistan's Indus Basin irrigated agriculture system, and thus to the economy at large. With a grant from the UNDP Umbrella Trust Fund, which was managed by the World Bank, the GOP prepared a *National Drainage Sector Environmental Assessment (DSEA)* (Government of Pakistan, 1993). It made strategy recommendations for the medium term that were adopted by the GOP as its strategy. DSEA's strategy stresses mainly activities to reduce environmental externalities, and redefining the intervention of GOP to issues and locations where the private sector cannot operate, areas with high risk, and where social equity is fragile. The DSEA defined a detailed action plan to implement the recommendations of the NCS. The DSEA recommended an ambitious 25-year irrigation and drainage investment plan (National Irrigation Program or NIP, and National Drainage Program or NDP), supported by an equally ambitious program of sector planning and policy studies, but did not recommend major institutional reforms as a means to address the environmental sustainability problems of the Indus Basin Irrigation System (IBIS).

In 1994, GOP published the results of a report prepared for it by John Mellor Associates (Government of Pakistan and John Mellor Associates, 1994), which recommended a series of institutional reforms to accelerate irrigated agriculture development in Pakistan. This report, which was a collaborative effort involving intellectual leaders in Pakistan's irrigated agriculture, galvanized momentum in favor of further institutional reforms at the level above the watercourse. It provided what would later turn out to be the blueprint for reforming PIDs through FOs, Area Water Boards, and the establishment of PIDAs under NDP.

In March 1994, the World Bank released a *new sector strategy* for Pakistan (World Bank, 1994) that advocated more fundamental reforms for the sector that went beyond the recommendations of the DSEA, and laid the basis for the reforms that were adapted under NDP. In the extended debate that followed the release of the draft report, a consensus emerged among GOP, WAPDA, and the provinces, the local research community and farmers' lobbies[14] over a version of the reforms proposed by the Bank, which were adapted to the realities of Pakistan and were viewed as more likely to be implemented because they were locally owned and formulated. These proposals subsequently formed the basis for NDP.

In the spring of 1995, the GOP initiated discussions with the World Bank with a view to obtaining financial and technical support to implement the recommendations of the NCS, DSEA, and its new irrigation and drainage strategy. The hope was that the World Bank would lead-manage the mobilization of the very significant sums of funding that would be required from Pakistan's development partners who were active in the irrigation and drainage sector, to fund a 25-year investment program, in successive series or cycles of intensity. Thus, NDP-I and NIP-I would be followed by successive NDPs and NIPs in roughly five-year intervals until

[14] Including Farmers Association of Pakistan (FAP), Kisan Board, etc.

their investment and institutional reform objectives had been fulfilled. Of critical importance to GOP and Sindh Province was the fact that these two operations would succeed LBOD and ISRP-II that would help WAPDA and Sindh to complete LBOD and initiate investment in the long-delayed and controversial Right Bank Outfall Drain (RBOD) project, which was to be connected to the LBOD via a siphon or Indus Link across the Indus River.

GOP decided to broaden the scope of the NDP and NIP operations to include reforming WAPDA's Water Wing, reforming the PIDs in Northwest Frontier (NWFP) and Balochistan provinces, and a number of important policy and planning initiatives that were to be implemented by the Ministry of Water and Power. NWFP and Balochistan provinces had previously been excluded (or rather, they had excluded themselves) because they perceived that the real issues of the reform agenda had more to do with drainage than irrigation, which was their primary interest. As long as Sindh was not willing to support the construction of the RBOD, and to allow Balochistan to discharge drainage effluent from its irrigated area bordering Sindh (that is, Pat Feeder), Balochistan was not interested in the NDP. In addition, the focus at that time was also on implementing the reforms on a limited pilot basis within some confined canal commands in Punjab and Sindh provinces, and if the pilots were successful, they would be extended to the other provinces. Within the GOP, the Special Secretary for Water Resources in the Ministry of Water and Power coordinated the dialogue with donors and provinces; under the direct guidance of the Prime Minister, Minister for Water and Power, and the President of Pakistan; all of whom he regularly consulted.

To facilitate the dialogue between 1994 and 1998, the World Bank funded and arranged for scores of Pakistani officials and farmers' lobby groups to visit countries such as Turkey, Mexico, Costa Rica, Egypt, United States, Australia, Spain, India, and Philippines, which were implementing similar reforms with various adaptations.

During the process of dialogue, the GOP expanded the scope and breadth of the reforms to include reforming WAPDA's Water Wing, all four PIDs, and a number of important policy and planning initiatives that were to be implemented by the Ministry of Water and Power. GOP created a Federal Irrigation and Drainage Cell (FIDC) to coordinate the federal role in the reforms, and to oversee the implementation of the national policy and planning studies that had by then become a crucial component of NDP reforms. It was understood that because of the expanded (national) scope of the institutional reforms, the individual reforms would initially be quite limited in depth; and the reforms would be intensified progressively in subsequent follow-on operations – as the pace of reforms gained momentum. The rationale behind this approach was that the reforms would be mutually reinforcing, as progress in one province or WAPDA would provide momentum for similar progress in another province or in WAPDA. However, the opposite was not necessarily true. Failure in one province or WAPDA, or indeed in one component of NDP (for example investment program) did not necessarily have a major bearing one way or the other on the performance in another province or component of NDP. To illustrate, until the advent of the military administration in 1999, NDP reforms were being implemented at a relatively faster pace in Punjab

province than elsewhere, because of strong political support and capable administrative leadership in PID. Progress in the research program was good, and institutional reforms in WAPDA, Sindh, and NWFP were also significant but lagged behind Punjab; and progress in the national policy and planning components implemented by the GOP's Ministry of Water and Power itself was negligible. The experience of Punjab provided the yardstick by which progress elsewhere was measured, but progress in Punjab was not affected seriously by limited progress elsewhere. Since the advent of the military administration, the momentum has shifted from Punjab to Sindh; and Balochistan has indicated its intention to withdraw from the project altogether. Among project components, the irrigation and drainage research component managed by WAPDA has been very successful, but this performance has not impacted any other component of the project such as the investment component, which has remained sluggish.

Agreement was reached with the World Bank on the principles and shape of the reforms between May and August 1995, which was communicated to the World Bank in two letters of development policy, detailing the reforms and requesting the World Bank for help in mobilizing financial and technical support to implement the reforms and associated investment programs under the NDP and NIP. The policy letters were discussed, amended and endorsed at a series of high-level marathon meetings/negotiations in Islamabad, some of which were chaired by the President of Pakistan, and included the Prime Minister, Cabinet, Chief Ministers of all the four provinces and key members of their Cabinets, scores of senior officials (Secretaries) of key ministries at national and provincial levels, the Chairman and Managing Directors of WAPDA, and leaders of farmers' lobbies (including, but not limited to, FAP and Kissan Board) and agricultural committees of the national and provincial assemblies. The Asian Development Bank and Japan's Bank for International Cooperation agreed to cofinance the NDP.

There had been a consistent flow of opposition to the reform proposals by the beneficiaries of the status quo (mostly PID staff and large-farmers) who expected to lose from the reforms. This opposition was largely expressed through misinformation in the media. Although the agreed reform package was significantly diluted from the original proposals, no sooner had the GOP and provinces announced the agreed package of reforms than the opponents of the reform intensified their campaigns against the proposals in the media. They characterized the reforms as having been designed and imposed by outsiders, notably the World Bank, as a condition for providing financial assistance to Pakistan. The intellectual community criticized the genuineness of GOP, whose interest they characterized as being motivated primarily by fiscal and balance of payment crises, with pressure originating from the on-again-off-again negotiations with the IMF for financial support. The farming lobby and the PID staff purposefully mischaracterized the reforms as privatization of the irrigation and drainage system, which evoked strident emotional support in the media. The reforms were also criticized by donors and irrigation experts in and outside Pakistan (including within the World Bank and most of the LBOD cofinanciers), who contended that the reforms did not go far enough, were not based on the

success of true-and-tied pilots, and were therefore unlikely to succeed. Some of this criticism was from some donors who were concerned that the reforms would fundamentally affect the institutional framework within which they would have to design their irrigation and drainage support programs in Pakistan. Among senior GOP and provincial officials, some legislators in the national and provincial assemblies, the media, and feudal landlords objected to the high-profile role that the GOP assumed in the irrigation reforms, primarily because the constitution of Pakistan has defined water as a provincial subject. They felt that by leading the reform process, GOP was encroaching on provincial domains, and even threatened constitutional court challenges. The media also weighed in, besides providing news and analysis. Since NDP had developed into a major long-running news story, the media had a legitimate need to obtain information from the principal actors and interest groups. Due to the tendency of government and donor officials to withhold information from the media, the latter were often left with few options (besides the opponents of the reforms and rumors) to satisfy their need for information. Finally, with the onset of the military administration in 1999, many senior military officers viewed the emphasis on institutional reforms and on expanding the knowledge base for the management of the IBIS as a waste of resources – especially among the influential officers who preferred to use donor resources (especially loans) for investment to expand the physical infrastructure. They viewed institutional reforms as a pretext to either weaken the traditional order of established Pakistani institutions or a pretext to avoid imposing needed discipline and stricter accountability for WAPDA and PIDs. In the view of most of these officers (many of whom were appointed to head institutions that had significant say over NDP reforms and institutions), the notion that semi- or mostly illiterate farmers should be allowed to control the irrigation infrastructure of Pakistan was not credible.

As the political environment in Pakistan became increasingly unstable toward the middle of 1996, opposition to the NDP reforms increased. The civilian government was dismissed in November 1996, and replaced by an interim administration in the center and provinces. The interim administrations of the GOP and provinces reconfirmed the terms of the reform package that had been agreed between the previous central and provincial administrations and the World Bank, ADB and JBIC in January 1997; and proceeded to enact the legal framework to establish PIDAs, AWBs, and FOs (that is, the PIDA Ordinances) in each of the four provinces.

Following the general elections, which saw the establishment of civilian administration in Islamabad and the provinces in May 1997 (which was previously the opposition), the negotiations with donors over NDP reforms were repeated albeit informally, and once again the reform package that was formally negotiated with the interim administration (which was essentially the same as the one agreed with the previous civilian administrations) was re-endorsed by the civilian administration in July 1997. The provincial assemblies of each of the four provinces confirmed the reform packages through enactment (voting) to convert the PIDA Ordinances into the PIDA Acts. In November 1997, the World Bank's Board of Directors approved the loan for NDP, and implementation started in January 1998.

Besides the political background described above, there are additional factors,[15] which explain the timing, scope, and nature of the final reform program under NDP. It demonstrates that the reforms were implemented because there was strong internal demand for them, which was supported by external supply from Pakistan's development partners. Furthermore, the interplay between supply and demand for NDP reforms was not necessarily one-way or disproportionately unequal between the Pakistani side and the donors: (a) the failure of the history of piecemeal reforms described above; (b) encouragement from the donors, who made it clear that their support for the irrigation and drainage investment program was dependent on Pakistan adapting and implementing those reforms (that is, GOP's own reforms, which had been adapted to suit domestic circumstances); (c) recognition that comprehensive reforms were required, including for WAPDA's Water Wing, and an ambitious program of policy research; (d) the federal political structure of Pakistan made it necessary (from a domestic political perspective) that all provinces be involved in the reforms in order to ensure political survivability for the reformers – no province would go it alone; (e) the intervention or leadership of GOP, making it necessary to scale-up the reforms in order to justify GOP's role in what is essentially a provincial matter; and (f) the reluctance of any province to be left out of the large pool of resources that was associated with the reforms. Indeed, the Territories of Azad Jammu and Kashmir (AJK) have also requested to be included in the program, despite not having any significant irrigation or drainage infrastructure, for essentially the same reason.

3.4. The agreed-upon reforms for implementation

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 headwork, and from main drains that cross canal commands and major drainage basins to inter-provincial drains operated and maintained

[15] Rinaudo *et al.* (2003) suggest a different explanation – the foreign currency reserves and the intervention of the IMF program – in influencing the pace and direction of the reform. However, it is largely speculative as the IMF played almost no role in the negotiations with the World Bank on NDP (rather, it was the other way round – agreement with the Bank on NDP was beneficial to, but not part of, the Government of Pakistan's negotiations with the IMF), and it also ignores all domestic politics that shaped the sequence of events.

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 headwork 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 sub-drains feeding into branch drains operated by AWBs.[16] 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. For its part, the Federal Government also decided 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.

3.5. The risks

The institutional reforms discussed above carry very significant risks. If fully implemented, the reforms would significantly alter 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, provoked spirited opposition. 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 hard budget constraints, more accountability, financial transparency and scrutiny, and possibly reduced costs and staffing, view the reforms as threats to their power, authority, and rent-seeking opportunities. Similarly, the 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, is viewed by some as a diminution of WAPDA's role in management of the irrigation and drainage system. The risks

[16] 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 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.

associated with the view of constitutionalists, irrigation experts in the donor community (as well as among the Pakistani intelligentsia) who either wanted 'first-best solutions'[17] or were concerned for the impact of NDP reforms on their own assistance programs, among the media, the military, and among the GOP officials, are enumerated above. There is a risk that these vested interests (some of which may have significant political and financial clout) would slow, or even stop, reform. The proposed reforms have already provoked strong adverse reactions from these opponents in the form of spreading misinformation, organized political opposition, successful attempts by feudal landlords to dominate the governance of the new institutions, outright denial of budget allocations, dismissal, prosecution on false charges, and harassment of officials at all three levels (GOP, WAPDA, and provinces) who implemented or were supportive of the reforms, and bureaucratic delays and stalling tactics including continuous whittling down of reform proposals at various stages during the drawn-out process of negotiations and even during implementation. However, this opposition has ebbed significantly as the project entered the implementation phase in Sindh province, but increased significantly in Punjab, WAPDA, and Balochistan under the military regime. Among Pakistan's development partners, while IWMI has strongly supported the reforms with a robust 'action research' program and active participation in the reforms as the technical partner of PIDs in Sindh, Punjab, and NWFP, the donors who were skeptical or non-supportive from the beginning remain so. The sense of threat is also subsiding as stakeholders perceive that the proposed reforms are either less harmful to their interests than initially perceived (having been diluted to take into account their concerns), 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 (that is, on-farm drainage and irrigation up to the minor/distributary level) from government to users, but also and more importantly to ensure that 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, the formation of entrenched, financially secure, and genuinely democratic FOs, AWBs, and PIDA will necessarily be a very slow process, especially since the proposed institutions 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 hold on the rural social power structure to frustrate social mobilization efforts and prevent or severely compromise formation of genuine FOs, AWBs, and PIDA. There is also a risk that the proposed institutions could be hijacked by feudal landlords, undermining their social

[17] NDP agreed reforms are perhaps best described as second- or third-best when compared with the ideal solutions, which however have no chance of being adapted in Pakistan's foreseeable future.

justice objectives and thereby be ineffective. Finally, there is a risk of bureaucratic impediments that could prevent the institutions from taking over management responsibilities for the 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 the new institutions would disrupt the strategy to improve O&M of the tertiary system by transferring responsibility to user groups.

4. Assessing the political risk of the NDP reforms

We illustrate below how we applied the analytical framework suggested earlier, using the information on the political economy of the irrigation and drainage sector of Pakistan to assess the level of political risk of NDP reforms.

4.1. Focusing on the most controversial reforms and the most effective players

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 policy, planning, and executing level; and (4) reforms at the lower-tier off- and on-farm level.

In carrying out the risk assessment and to keep the analysis manageable, we selected a subset of five reforms which we judged to be of greater analytical interest: (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. These reforms are described in detail in table A1 below.

The number of players is also relatively large. Groups and individuals affected by the reforms, and in a position to affect the outcome of the reforms, include, for example the GOP, its leaders and agencies, WAPDA, provincial governments and their leaders and agencies, local organizations, the media, affected officials, farmers' groups, Pakistan's development partners (those involved in NDP as well as those not involved), and ordinary farmers. (A partial 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, for simplicity. The parties considered for our analysis include AWBs (Area Water Boards), FOs (Farmer Organizations), PADs (Provincial Agriculture Departments), PFDs (Provincial Finance Departments), PIDs (Provincial Irrigation Departments), PIDAs (Provincial Irrigation and Drainage Authorities), WAPDA (Water and Power Development Authority). Their interaction with the reform is explained in table A1.

4.2. 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 table A2 below. It should be noted that it is possible that two players using similar means to influence the reforms' achievement levels may end up having different actual impacts.

4.3. Cost of influencing reforms' level of achievement

Table A3 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 (that is, 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 (that is, 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 (especially foreigners who might offer needed technical and financial support), and very little cost/effort by the opponents for failure.

4.4. Level of achievement

Table A4 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 reforms. As mentioned earlier, we measured achievement both in terms of fulfillment of the reform components and the time frame needed for such achievement.

4.5. Hypotheses

Following Haggard *et al.* (1995) we produce several testable hypotheses based on the information in tables A1–A4. Haggard *et al.* propose that the inability of groups to organize and influence negatively affects their gains from the reform. Accordingly:

1. Reform 1 (Transformation of PIDs into autonomous PIDAs and AWBs) could have uncertain achievement level, in the absence of strong government commitment and follow-through actions, since several of the players may both gain and perceivably lose from the reforms, and the influence function of several players is not well defined.
2. Reform 2 (Transfer of responsibilities for management of the systems at the minor and distributary level and small drains to FOs) could score low in the absence of strong government commitment and follow-through actions, because the perceived losers have their own influence channels, while the group of gainers viz., small farmers are constrained by lack of organization and low influence.
3. Reform 3 (Performance contracts awarded to the private sector for carrying out operation and maintenance–O&M of irrigation and drainage–I&D infrastructure) could score high because of the power structure (the perceived losers viz., PIDAs and AWBs also have potential gains from this reform), and because of the relative efficient influence the proponent groups have.
4. Reform 4 (Establishment of water rights and formation of water market) could score low because the main gainers viz., small farmers are constrained by lack of organization and low influence, and the low level of information and understanding of this reform.
5. Reform 5 (Defining the operational jurisdictions of various institutions in the water sector) could score medium given the starting conditions, that is, well-structured legal framework defining operational jurisdictions, and the equal level of influence of the perceived gainers (PIDAs and AWBs) and losers (WAPDA).

4.6. The Delphi process

We provided the information in the tier one procedure (tables A1–A4) to a panel of 12 experts familiar with the water and drainage sector in Pakistan and with the reform process. We selected the panelists from the development finance agencies sponsoring the project and from other international agencies. We did not select panelists from any of the interest groups associated with the reforms because we wanted to retain the politically neutral professional views.[18] 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

[18] In selecting the panel, we addressed the concern raised by Gupta and Clarke (1996: 187) that the panel should not include members that could promote the desirable outcome. Our panel included also panelists known to criticize the reforms (as is indicated earlier in the text) as long as they do not have any stake in the reform outcome.

were presented before. The panelists were provided with the information in tables A1–A4, and with table A5 to record their scores.

Only seven experts responded to the questionnaire.[19] In the first round of the Delphi process, we asked the participants to fill in a form with probabilities for three reforms achievement levels (high, medium, and low achievement levels) that were defined. We analyzed the results of the first round (table 1), and found that the coefficients of variation (CV) for reforms 1 and 2 were relatively high (>50 per cent), compared with the truncation level. Therefore, we initiated a second round of the Delphi process for reforms 1 and 2 only. The second round of the Delphi process yielded results with CV values below 50 per cent (table 1), which then replaced the values reported for reforms 1 and 2 in table 1.

We present the consolidated values from the Delphi process in table 1. 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 for a medium achievement level, 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. Reform 5 was assigned similar probabilities of 'medium −' to low and high achievement levels.

5. Discussion of the results

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

[19] This constitutes a response rate of nearly 60 per cent. Kastain *et al.* (1993) use in their research of health care performance in the Netherlands several sizes of panel groups ranging from 5 to 19 experts. Using an indicator for the reliability of the results, Interclass Correlation Coefficient (ranging in value from 0 to 1), they demonstrate that the incremental reliability is declining as the number of experts increases, with a negligible increase in value beyond ten experts.

Table 1. *Probabilities assigned to the reform achievement levels in various rounds of the Delphi process*

Reform	*1*			*2*			*3*			*4*			*5*		
Achievement Level	*Low*	*Med*	*High*	*Low*	*Med*	*High*	*Low*	*Med*	*High*	*Low*	*Med*	*High*	*Low*	*Med*	*High*
Round 1, all reforms															
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
Round 2, reforms 1 and 2															
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									
Final probability values															
Probability	1.3	2.9	1.6	1.4	2.4	1.6	1.4	2.9	2.1	2.4	2.0	1.1	1.6	2.4	1.6

Note: Probability values are: 1 ≡ 0–25%; 2 ≡ 25–50%; 3 ≡ 50–75%; 4 ≡ 75–100%.

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 (for example, Linstone and Turoff, 1975a). 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:

1. Reform 1 (Transformation of PIDs into autonomous PIDAs and AWBs) has high–very high chances for medium achievement level.
2. 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 achievement level.
3. Reform 3 (Performance contracts awarded to the private sector for carrying out operation and maintenance–O&M of irrigation and drainage–I&D infrastructure) has high–very high and medium chances for medium and high achievement levels, respectively.
4. Reform 4 (Establishment of water rights and formation of water market) has medium–high and medium chances for low and medium achievement levels, respectively.
5. Reform 5 (Defining the operational jurisdictions of various institutions in the water sector) has medium chances for medium achievement level.

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 account the relative cost and chances of achievement, that is 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.

How did the reforms actually perform? How do the results of our *ex-ante* analysis compare with actual performance levels? An answer to these questions can be found in the next section, which summarizes the mid-term

performance of the NDP Project, four years after its implementation (with some reforms having still 20 years to go).

5.1. Epilogue on recent status of the reforms[20]

As can be expected under any major institutional reform program, performance has been so far mixed, with performance on some aspects being better than those on others. This mixed performance reflects a combination of the political economy factors indicated in this paper, as well as impact (such as regime change), not taken into account in our analysis, and issues relating to coordination, change management capacity, lack of previous experience, and initial teething issues. Delineation of operational responsibilities among the various institutions in the water sector is proceeding well. WAPDA continues to move away from intra-provincial irrigation and drainage, and focuses more on inter-provincial aspects, and is moving towards water resource development of the Indus Basin. Similarly, operations and maintenance of the irrigation and drainage system through performance contracts awarded to the private sector is steadily progressing. At the provincial level, progress on reforms has been slow. Although the PIDA Acts were passed and the PIDAs were established in all provinces in 1997, the PIDAs are not operational or autonomous yet as was originally envisaged. All Provinces have identified and established (that is, officially notified) the pilot AWBs. However, these AWBs are not operational or autonomous yet, except in Sindh province where in the Nara Canal, AWB has started operating in a limited manner. The process of piloting FOs has been moderate in Sindh, slow in Punjab, and just started in NWFP. Balochistan province has indicated that it would be withdrawing from the NDP Project. Although progress on the provincial reforms has been slow, there has been no reversal of the reform agenda. Water rights and water market reform has not progressed so far. Given the many pre-requisites for such reform and the existing informal water transfers within irrigation perimeters, it is expected that inter-canal transfer entitlements would drag behind for some time (Bunyasi, 2003). The government of Pakistan remains committed to the institutional reform program. It has reaffirmed the central importance of institutional reforms to the long-term success and sustainability of its National Drainage Program. The government has recently indicated that implementation of the institutional reform program should continue as envisaged under the NDP Project, while maintaining some flexibility to take into account physical, environmental, and social compulsions of the different provinces, but without compromising the original spirit and concepts of the reform package.

Was the political risk assessment done by the Delphi correct or not? All reforms are in very early stages of their journey, and thus it could be unfair both to the Delphi and to the reforms to judge the progress at that early stage. A comparison of the hypothesized likelihood with the Delphi assessment and the actual progress of the five reforms in 2001 (table 2) suggest that the

[20] Facts updated for April, 2001 based on Government of Pakistan (2001).

Table 2. *Comparison of risk assessment in the analysis of NDP reform in Pakistan*

Reform	*Hypothesized likelihood of success*	*Delphi assessment*	*Progress as of 2001*
1	Uncertain	High to very high probability for medium achievement	Selective success, depending on province
2	Low	Medium probability for medium achievement	Moderate to slow progress
3	High	High to very high probability for low achievement and medium probability for medium achievement	Progressing
4	Low	Medium to high probability for low achievement and medium probability for medium achievement	Not progressing
5	Medium	Medium probability for medium achievement	Progressing well

Delphi did a reasonable job. Again, we need to be very careful in interpreting the results of table 2 because the values on both row 1 and 2 refer to the long run, and those in row 3 refer to the short run. However, in three (reforms 2–4) out of five reforms, Delphi provides similar assessment as the actual situation in 2001; for reform 1 Delphi overestimated, and for reform 5 Delphi underestimated the risk of progress.

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Appendix

Table A1. *Potential winners and perceived losers involved in 5 reforms*

Reform	*Present situation*	*Potential winners*	*Perceived losers*
(1) Transformation of PIDs into autonomous PIDAs and AWBs. Several components:	PIDs:	PFDs: Fiscal savings through reduction in subsidy to the I&D sector. Federal Government: (a) Fiscal savings through reduction in costs on drainage; (b) Long-term financial sustainability of the I&D system. Large Farmers: Direct beneficiaries of any efficiency gains (e.g. through better operation and maintenance of the irrigation and drainage infrastructure, cost reduction). Small Farmers: Direct beneficiaries of any efficiency gains (e.g. through better operation and maintenance of the irrigation and drainage infrastructure, cost reduction).	PIDs: 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. Large farmers/landlords: (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. Provincial Revenue Departments: They are currently in charge of revenue collection. This function would now devolve to the PIDAs and AWBs.
(a) Linking of revenues and expenditures (hitherto, the PIDs were only concerned about the expenditures).	(a) No linkage between expenses and revenues of PIDs		
(b) Achievement of financial self-sustainability within stipulated period.	(b) Funded fully by the state, no financial self-sustainability.		
(c) Cost reduction including possible reduction in staffing.	(c) Financial health dependent only on increased water charges.		
(d) Revenue enhancement through increase in user charges, broadening of the charge to include urban and industrial users, etc.	(d) Revenues are collected only from the agricultural sector.		
(e) Financial transparency.	(e) No transparent or published accounts; not tested for financial health.		
(f) Corporate governance.	(f) Non-existent		
(g) Transparency in water allocation and distribution.	(g) No water allocation and distribution rules.		

Table A1. *Continued*

Reform	*Present situation*	*Potential winners*	*Perceived losers*
(2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs.	Water distribution and drainage systems are managed by the irrigation department of the provincial government. FOs have no responsibilities beyond participating in canal construction.	Small Farmers: FOs would help in more equitable distribution of water, and sharing of the benefits of irrigation and drainage. PFDs: Fiscal savings since these costs are now borne from the state budget. PADs: 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.	Large Farmers: Formation of FOs and the transfer of responsibilities to FOs would result in loss of control over the I&D system. This would result in change in the social structure (feudal system) over which they have traditional control. WAPDA: Loss of the responsibilities for carrying out on-farm drainage (tubewells, tile drains, etc.). PIDAs and AWBs: (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. Provincial Revenue Departments: They are currently in charge of revenue collection. This function would now devolve to FOs. PADs: Their role in carrying out civil works (watercourses) would be reduced.

(3) Performance Contracts Awarded to the private sector for carrying out O&M of I&D infrastructure.	Done by provincial government departments through hiring of existing staff (overtime), and purchase of special equipment.	Business Community (Contractors): Increased business opportunities since these works are now being directly executed by the PIDs. Farming Community: Better operating I&D system (since today they suffer the impact of the non-operating I&D infrastructure). PIDAs and AWBs: Reduction in costs since the private sector can carry out the works more efficiently and in a cost-effective manner.	PIDAs and AWBs: 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.
(4) Establishment of water rights and formation of water markets.	Water trading between watercourses is prohibited. Water rights exist through *Warabandi*, but not enforced.	Small farmers: (a) water rights would be much more clearly defined; (b) water trading would be legitimized.	Large farmers: Loss of the control which they today command (because rights are not clearly defined now).
(5) Defining the operational jurisdictions of various institutions in the water sector.	WAPDA and provincial PIDs through ad hoc distribution of responsibilities handle development and operation of the water sector.	PIDAs and AWBs): They would now have operational jurisdiction over intra-provincial drainage functions, which hitherto were carried out by WAPDA.	WAPDA: 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 a large-scale construction role, and change to a 'knowledge management' role, and construction and management of inter-provincial irrigation and drainage.

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.

Table A2. *Actions taken by interest groups for and against the reforms*

Reform	*Means by which parties affect reform achievement levels*
(1) Transformation of PIDs into autonomous PIDAs and AWBs. This would include: (a) Linking of revenues and expenditures (hitherto, the PIDs were only concerned about the expenditures). (b) Achievement of financial self-sustainability within stipulated period. (c) Cost reduction including possible reduction in staffing. (d) Revenue enhancement through increase in user charges, broadening of the charges includes urban and industrial users, etc. (e) Financial transparency. (f) Corporate Governance. (g) Transparency in water allocation and distribution.	Federal Government: (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. PIDs: (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. PFDs: 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. PRDs: Passive opposition to reforms since this is only one of their several responsibilities and interests. Large farmers: (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. Small farmers: 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.
(2) Transfer of responsibilities for management of the system at the minor and distributary level and small drains to FOs.	Federal Government: (a) providing co-ordination function; (b) persuading other players. PIDAs and AWBs: (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&D system would degenerate because of lack of O&M.

	PADs: (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. WAPDA: (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. PFDs: Passive support since this is only one of their several responsibilities. Large farmers: (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. Small farmers: 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.
(3) Performance Contracts Awarded to the private sector for carrying out O&M of I&D infrastructure.	Federal Government: (a) providing co-ordination function; (b) persuading other players. PIDAs and AWBs: (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&M; (e) providing arguments that they have existing capacity which would be wasted. PFDs: Passive players since they do not get involved in details of I&D operations. Large farmers: Passive players since they are not very interested in the operational aspects of PIDAs and AWBs. Small farmers: 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. Contractors: Limited influence on policy decisions such as contracting out to the private sector.

Table A2. *Continued*

Reform	*Means by which parties affect reform achievement levels*
(4) Establishment of water rights and formation of water markets.	Federal Government: (a) providing co-ordination function; (b) carrying out of studies; (c) persuading other players. PIDAs and AWBs: (a) providing misinformation to political bosses; (b) providing misinformation in media; (c) creating scare about privatization of water; (d) frustrating efforts to develop physical infrastructure required. Large farmers: (a) providing misinformation to political friends; (b) providing misinformation in media; (c) creating scare about privatization of water. Small farmers: 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.
(5) Defining the operational jurisdictions of various institutions in the water sector.	Federal Government: (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. PIDAs and AWBs: (a) demonstrating ability to carry out increased responsibilities in selected areas; (b) bringing political pressure through Provincial politicians. WAPDA: (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.

Table A3. *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.

	Cost to the parties of impacting reform achievement levels																													
	Cost (small, medium, high) Associated with impact on various reform achievement levels (low, partial, full)																													
	Federal Govt.			*PIDs*			*PIDAs and AWBs*			*WAPDA*			*PFDs*			*PADs*			*PRDs*			*Large Farmers*			*Small Farmers*			*Contractors*		
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*	*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	M	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	M	S	H	H	H	S	M	H	H	H	H	M	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	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	M	S																		

Notes: (a) Blank cells mean that the player is not significantly affected by the reform (See also table A1).

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

Table A4. *Perceived reforms achievement levels*

Reform	*Reform achievement level*		
	High/full	*Medium/partial*	*Low/failure*
(1) Transformation of PIDs into autonomous PIDAs 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 PIDAs and AWBs for recurrent expenditures reduced to zero in ten years; and subsidy to FOs reduced to zero in seven years.	Subsidy to PIDAs and AWBs for recurrent expenditures not reduced to zero in 20 years; and subsidy to FOs reduced to zero in 15 years.	Subsidy to PIDAs, 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.
(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 ten years.	FOs established and take over 50% of distributaries and minors and small drains in ten 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 five years; and 100% in ten years.	O&M in 25% of area carried out through contracts awarded to private sector in five years; and 50% in ten years.	O&M carried out through force-account by PIDAs and AWBs.

Table A4. *Continued*

Reform	*Reform achievement level*		
	High/full	*Medium/partial*	*Low/failure*
(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.
(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 ad hoc 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.

Table A5. *Data recording of probabilities of reforms' achievement levels in the Delphi process*

Given the information in Tables A1–A4, 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 achievement level		
	Low	*Partial*	*Full*
Reform	*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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