

# 1 BACKGROUND AND RATIONALE FOR ASSESSMENT

## 1.1 GoP Increasing Allocations to Meet Rising Public Infrastructure Demands

1. Poor infrastructure services result in constrained economic activity and reduce the country's growth potential. Elasticities of business sector output and productivity with respect to public core infrastructure investments are usually much higher than that of private business investments. The GoP's ability to plan and deliver infrastructure projects effectively will determine the future pace of growth of the country.

2. According to the World Economic Forum Survey (2006-07) of 125 countries, Pakistan ranked 67 in basic infrastructure category. Historically, the balance between demand and supply of infrastructure facilities has faced a chronic imbalance. For instance, (a) the aging and inadequate irrigation and water infrastructure deficit alone is estimated at Rs4 trillion (US\$70 billion) and Pakistan needs to invest almost Rs60 billion (US\$1 billion) per year in new large dams and related infrastructure over the next five years<sup>1</sup>, (b) the underperformance of the transport infrastructure costs the economy Rs300 billion (US\$5 billion)<sup>2</sup> per year and (c) existing power shortages of approximately 2000 megawatts will increase to 6000 megawatts by the year 2010 and 30,700 megawatts by the year 2020.<sup>3</sup> The per capita energy consumption in Pakistan is amongst the lowest in the world<sup>4</sup> and a lack of adequate energy resources precludes industrial growth affecting all sectors of the economy.

3. After the lost decade of the 1990s, Pakistan's economy has bounced back and has been exhibiting growth rates of above seven percent in recent years.<sup>5</sup> This, coupled with population growth rates of over two percent,<sup>5</sup> places an acute demand on basic and advanced infrastructure. The recent power shortages are a classic example of the rapidly growing economy's aging and deficient power infrastructure which is failing to cope with burgeoning demand and resulting in an energy crisis in the country. A similar situation also prevails in the supply of the transport infrastructure in Pakistan. It is obvious that lack of appropriate public infrastructure is constraining, (a) GoP's ability to transfer the impact of this growth to the wider public, (b) delivery of basic public services, (c) sustained advancement of traditional sectors such as agriculture and textiles and (d) development of emerging sectors such as services and industries required for continued economic expansion. Therefore, the GoP requires heavy investment in physical infrastructure in order to improve delivery of social services and to enhance its internal and global competitiveness. In short, the infrastructure crisis is here, but the 'meltdown' will be inevitable in five to ten years unless the GoP is able to respond in-time.

4. The GoP has responded to this demand by planning extensive infrastructure expansion. The federal MTFDF, allocates Rs2,162 billion (US\$36 billion) to the development of large infrastructure—embarking on an ambitious program to upgrade roads, railways, air, power, water and irrigation and other infrastructure. Of this, Rs993 billion (US\$16.3 billion) will be through the Public Sector Development Program (PSDP). The MTFDF envisages a tripling of the infrastructure PSDP from an average of Rs150 billion per year to Rs440 billion per year. The current FY08 PSDP allocation of Rs520 billion has already eclipsed this target.

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<sup>1</sup> Briscoe and Qamar, "Pakistan's Water Economy Running Dry", The World Bank, 2006

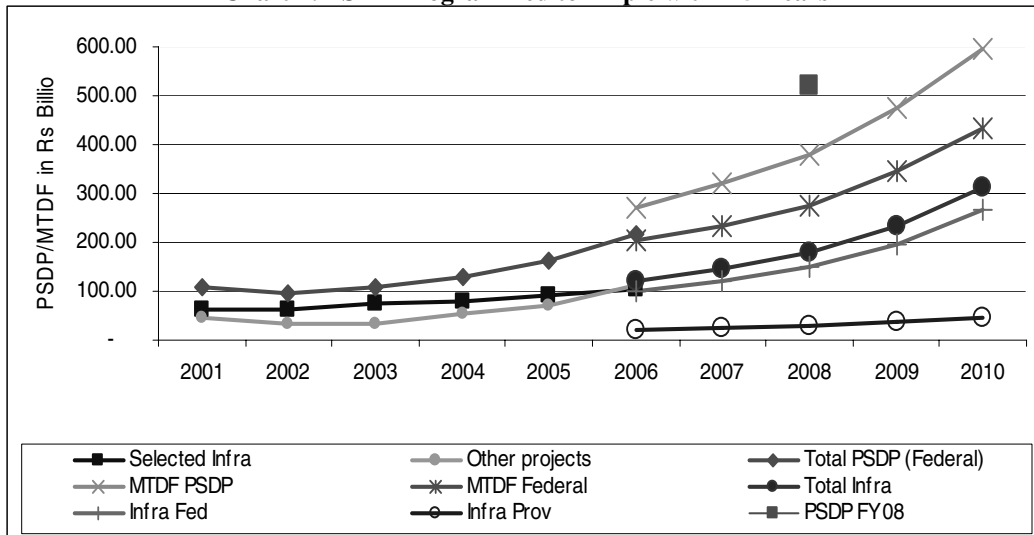
<sup>2</sup> "Transport Competitiveness in Pakistan", The World Bank, 2006

<sup>3</sup> "Potential and Prospects for Regional Energy Trade in the South Asia Region", The World Bank, 2007

<sup>4</sup> "World Development Indicators", The World Bank, 2007

<sup>5</sup> "Economic Survey of Pakistan", Government of Pakistan, 2006-07

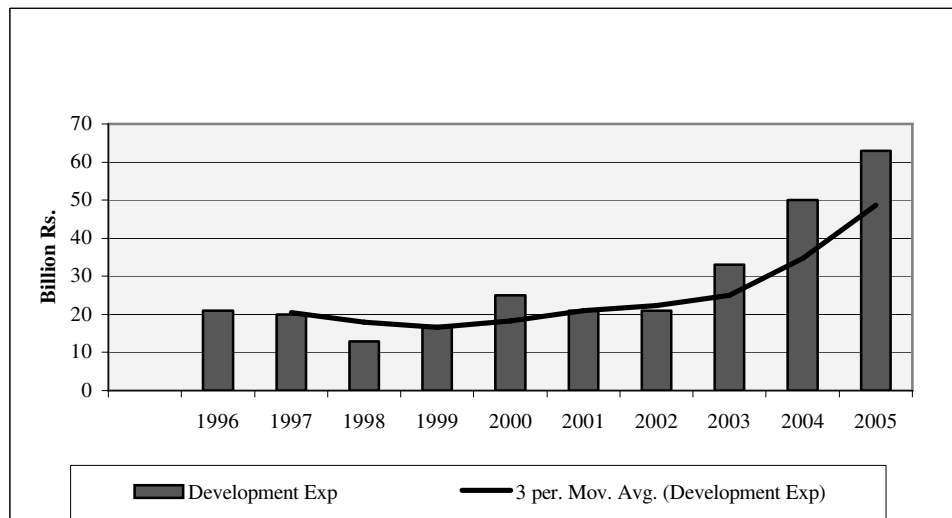
**Chart 1: PSDP Programmed to Triple within 5 Years**



5. There are other emerging infrastructure programs that are required to respond to the rapidly developing economy, and are not entirely included in the MTDf. These include the National Trade Corridor Improvement Program (NTCIP), the construction of large water reservoirs (Kalabagh, Diamer, Bhasha), the rehabilitation of the key barrages, delivery of clean drinking water, sanitation, and electricity to all and the new Islamabad Airport project (which alone require substantial investments over and above the MTDf).

6. In addition, provincial governments, districts and towns/municipalities have also embarked on infrastructure improvements in the face of rapid urbanization. Provincial capital development expenditure has tripled during the last three years alone and is projected to grow as devolution takes root and service delivery improves during the coming years.

**Chart 2: Provincial Development Expenditure Growing**



7. In formulating these plans, the various tiers of government have primarily focused on identification of the required infrastructure and on the availability of public financing. There is also the growing realization that ‘this infrastructure was needed as of yesterday’—that is why,

most of the implementation periods for this infrastructure delivery is now or at the latest over the next five to seven years. However, very little analysis has been done to factor in the constraints that may or will be posed by the wider construction industry.

## 1.2 Are There Implementation Challenges Going Forward?

8. Public infrastructure implementation goes through the stages of planning and approvals, financial allocations, detailed engineering and physical construction, and finally through commencement of operations. A quick review of the project cycle in Pakistan during the past few years shows weaknesses in all these stages. Of particular interest, and the easiest to find analytical data on, is the planning and financial allocation for projects. This is the foundation of project implementation and this is where things start to go wrong.

9. Poor incentive structures motivate an annual ‘mad rush’ wherein each public agency puts in requests for maximum possible allocations. The agency neither considers their portfolio’s throw-forward, nor do they analyze their implementation capacity. It is common to find that, based on annual project allocations the projected average completion times for projects are seven to eighteen years—a figure that should normally not exceed three years. This occurs because too many projects are taken in hand simultaneously and without proper planning. So even though ‘on-the-record’ it appears that total public allocations are more or less spent, the picture is much more complicated—expenditures are not in line with plans and priorities—a lot of projects are allocated money before they are ready for implementation.

10. *Based on the allocations in the PSDPs/ADPs of the last 5 fiscal years, individual infrastructure projects in Pakistan would take a long time to complete—18 years on an average for irrigation and power (ranging between 3.4 years to 30.8 years) and 8 years on an average for roads (ranging between 4.6 years to 13.6 years).<sup>6</sup>*

11. For example, during FY04, two hundred and eighty three projects (costing Rs43.62 billion) at federal and provincial levels in power, irrigation and roads, were allocated a sum of Rs5.16 billion, which was never spent. Conversely, in the same period, fifty nine projects (costing Rs241.43 billion) which were not allocated any money in the budget incurred an expenditure of Rs75.156 billion. So, the agencies started with annual allocations for these two hundred and eighty three projects which were far less than optimal (optimal allocations could be around Rs12 billion), and in effect indicated to stakeholders that these projects will drag on an average for more than eight years. Then, the agencies undertook expenditures on fifty nine new projects which are not in the portfolio and spent above optimal amounts from unplanned allocations indicating their intent to finish these large, ‘unplanned’ and politically motivated projects in a three-year period.

12. *As demonstrated above, the public agencies seem to be taking-on too much and delivering too little—the ‘little’ that they do deliver is mostly determined by the political priorities.* But often, even when the government has tried to force public agencies to reduce the portfolio throw-forward, money has been difficult to come-by. The reason behind this lies in the

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<sup>6</sup> This assessment is based on analysis of the federal and provincial expenditure portfolio in the power, irrigation and roads sectors over the last three to five years. See Technical Note 6: ‘A Review of Allocations and Expenditures in The Public Sector’

nature of public infrastructure projects and related dynamics of the financial allocations.

13. Delivery of public infrastructure has long gestation periods and is built to cope with future anticipated demand. This requires visionary planning and often entails seemingly large preemptive investments. These investments are a political-hard-sell as they cater to a future that is often difficult to visualize today. Further, the higher discount rates in developing countries create a challenge to appropriate funds for public infrastructure from urgently needed consumption expenditures. This in-turn puts huge public pressure on the timely delivery of such projects—high visibility of these projects has often been a political graveyard. Delays therefore, not only have economic costs but also large political costs.

**Box 1: Impact of Delays on Project Cost**

The overall delay in completion of projects is an accumulation of various delays that are caused during the different stages of a project. In turn the impact of delays on the cost of the project can be viewed as consisting of: (a) additional cost of fixed overheads incurred by the contractor; (b) increase in cost of construction materials purchased at a date later than that when the materials would have been purchased at the time of inputs according to the project plan; (c) financial costs of idle plant and equipment committed to the project by the contractor; (d) opportunity cost of the contractor when resources and capacity remain tied-down to a project during the period of delays (consisting of human resources, finances, plant and equipment, management) and hence prevented him from taking up other projects; (e) operating with negative cash flows and hence incurring a cost of funds arranged, or extended credit availed and; (f) reduced benefits from the project to the beneficiaries. Research carried out as part of this study clearly demonstrates that these delays which average about three times the original implementation period end up doubling the initial cost of projects.

14. Delays also lead to poor commercial returns to construction related enterprises which results in inverse growth of those involved in delivery, such as contractors, consultants, and equipment and material suppliers<sup>7</sup>. This also includes HR which suffers from the low returns. Investing in HR development and growth has no longer remained a viable option. This is a primary part of the infrastructure delivery challenge.

15. Infrastructure projects are usually completed at higher than estimated costs—globally, completion costs average 36 percent more than what has initially been planned and budgeted. This is due to factors including non-robust initial price estimation, price escalation over time, exchange rate variations, natural calamities, force-majeure, and other contractual claims due to poor planning. In Pakistan the unusually long project completion time creates a further cost disadvantage. But, the question arises what is the average completion time and cost for infrastructure projects in Pakistan?

16. The present study conducted a review of the business processes within the context of a typical project life cycle of a water reservoir project implemented by a private enterprise in Pakistan<sup>5</sup>. It used confidential management, administration and accounts data from a participating private construction enterprise. *For the relatively medium sized water reservoir project (estimated cost of Rs271 million), the planned project completion time was 24 months and actual completion was achieved in 72 months with an estimated cost of delays at 32 percent (excluding lost benefits planned from the project).* The contractor ended up indirectly financing the project and incurred losses of Rs19.4 million due to uncompensated costs of delays. *While*

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<sup>7</sup> See Technical Note 4: 'Business Environment and Cost of Doing Business'

*the costs to the economy due to the scheme becoming operational four years later than the intended time have not been factored into this analysis, it is believed that these would be substantial—and so would be its adverse political fallout. In summary, a typical infrastructure project in Pakistan costs twice as much and takes three times longer than planned.*

17. Overall, the evidence on this is hard to come by in the official public records, as public sector agencies keep revising the PC-I costs and thus legitimizing increases, without tracking the increase and reasons separately. Sample evidence of this is as follows:

**Table 1: Comparison of Estimated Costs and Subsequent Revisions**

Project	Estimated Cost <sup>8</sup> (Rs in Million)	FY	Revised Cost <sup>8</sup> (Rs in Million)	FY
Chashma Right Bank Canal	13,870	2000-01	17,097	2002-03
Lahore Islamabad Motorway	27,899	2000-01	39,000	2002-03
Gwadar Deep Water Port (Phase - 1)	10,000	2000-01	16,380	2005-06
PAEC Chashma Nuclear Power Project- II	39,000	2001-02	51,046	2005-06
Secondary Transmission & Grids	27,248	2000-01	37,087	2005-06

18. The current implementation process is inefficient, physical infrastructure does not come ‘online’ on-time. These delays affect not just the political economy but the development of commercial enterprise—this is the vicious circle of poor infrastructure implementation in Pakistan<sup>7</sup>. *Any attempt to meet the expanded public infrastructure needs through existing processes, resources and skills, will lead to colossal wastage of scarce resources and frustrate all efforts to meet delivery targets.*

19. While summarizing the two preceding sections, it appears that the GoP is willing to finance the rising infrastructure demand but money alone cannot implement and all visible signs point to a lack of proper implementation capacity in the country. The GoP is faced with a tremendous implementation challenge and it is this realization that fuels GoP’s demand for this report. Before developing the analytical framework used by the study, a useful exercise will be to look at some global and local characteristics of this infrastructure industry—the context in which the story will unfold.

### **1.3 Industry Peculiarities, Local Market and Policy Failures—why doesn’t demand fix the supply?**

20. <sup>9</sup>*Construction is a risky business:* There are no consistent economies of scope and scale. Infrastructure implementation carries more risks compared to other types of economic activities. Unlike a typical manufacturer or an agricultural producer, the contractor and consultant move from site to site, organize the logistics for timely assembly of job specific inputs, and follow a custom design for each site. Jobs are usually won through specific bids. Therefore, costs have to be estimated for each site (or each job), with assumptions made about many variables such as site conditions, weather, productivity of labor, equipment and time required for delivery of inputs.

21. *Large infrastructure is riskier than buildings:* For large infrastructure (large dams, roads, ports, canals and barrages), the risks involved in bidding exceed even those for (small to medium)

<sup>8</sup> These revised costs are as reported in the PSDP. These do not reflect the additional costs for delays, escalation, change in design and other related claims.

<sup>9</sup> Section 1.3 was prepared with the assistance from reports used in the literature review

buildings because the scale of work is usually larger (could be spread over geo-physically diverse areas), the use of heavy equipment is greater similarly, the sensitivity to the effects of inclement weather and remoteness from service and supply centers are far more pervasive. Since the majority of large infrastructure output is dependent on capital expenditure, demand tends to fluctuate considerably more than for most other industries. The consultants, contractors, and suppliers, thus, have to face the risk of sharp fluctuations in volume of work which affects the number of employees and amount of equipment. Again, the risks tend to be greater and the fluctuations more marked for mega infrastructure than for buildings.

22. *Relatively higher level of HR requirement:* Good construction implies good management of risks. This requires skilled HR which are scarce in developing countries. The risks involved in small- and medium-scale building construction work can usually be understood and evaluated by relatively less sophisticated managers. Civil works, on the other hand, require managers who are capable of evaluating and handling a wider, complex array of risks. The necessary managerial and technical ability is generally developed with much greater difficulty and is usually in short supply.

23. *“Us versus Them” syndrome:* Traditionally, governments have liked to control infrastructure delivery by using Marxian maxims and ensuring state participation in construction and related activities. The government ‘project team’ plans, designs and delivers the infrastructure. This appears to be a very effective mechanism but in reality it is often non-transparent and leads to all the various evils that are associated with lack of clear accountability. When outsourcing construction and related activities, the same government forgets the word ‘team’ in the ‘project team’ and has traditionally appeared to have adopted the ‘us versus them’ attitude by assuming the traditional roles of a client and service provider. With the client also being the owner, and the owner (at least on paper) being subject to public accountability, the contracts are often biased in their favor in order to limit exposing public finances to risk liability. Therefore, the enterprise part of the industry, especially the private sector, is often subject to excessive and unnecessary risks. These risks are not ‘visible’ in the government executed projects mostly because of the explicit ‘project team’ approach and partly due to absence of clear accountability. We thus find governments under pressure to deliver large infrastructure programs resorting back to the use of force-account<sup>10</sup> or parastatal delivery mechanisms.

24. *Limited focus on professional development—t2 and t3<sup>11</sup> Challenges:* By the nature of the production cycle—such as confinement to project sites 24/7 and uncertainty of demand, large civil works contractors and their managers generally give inadequate attention to the training of staff, especially at the level of management, which is essential to permit greater delegation of responsibilities in support of further growth of the company. Joint ventures and subcontracting arrangements between foreign and domestic firms, while sometimes useful, have not generally proven successful in the transmission of managerial know-how, except in cases where the local partner had a sound management background. Domestic firms are often seen as partners of necessity and relegated to low-end-technical and public relations work. Subcontractors tend to receive special help only when they are the sole supplier of a particular good or service in the market and, therefore, must be cultivated.

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<sup>10</sup> The most common form of state participation in construction is force account operation in which a government department administers services directly to achieve construction or maintenance goals. Force account units often attend to emergencies, undertake works that do not attract competitive contracting, and carry out routine maintenance.

<sup>11</sup> Technology transfer (t2) and technology transfer and training (t3).

25. *Owner-Managers often the bane of industry:* Owner-managers abound in the industry. They normally come from another trade or could be professionals who were earlier serving in the industry in another capacity. During periods of high-demand (periods of high economic growth), their capacity to effectively run businesses reflects inherent weaknesses. This is a fact that is often ignored in debates on implementation capacity assessment because it is these owner-managers who are often assigned the task to assess causes for lack of implementation capacity. They often politicize their trade associations and do not appropriately protect and advance the real interests of the industry.

26. *Pakistan has all the above and a predominantly public owner-client coupled with even higher risks:* Compared to other countries, the public sector is a much larger client than the private sector in Pakistan. Infrastructure implementation can broadly be classified into two categories. One provided by the public sector and the other provided by the private sector. Typically, both in developing and developed countries, residential, official and industrial buildings under the 'Building Sector' category account for seventy percent of the infrastructure delivered, and the clients in these cases are primarily private even though the government may have direct or indirect control over the demand. Transport, water supply (irrigation, power, storage and drinking), sanitation, storm-water disposal, and power generation categorized as the large 'Civil Works Sector,' accounts for the rest of the infrastructure delivered, and the client is primarily public. In Pakistan, this seventy-thirty breakup is closer to fifty-fifty. This is food for thought regarding the role of the government in providing infrastructure that can be more efficiently delivered by the private sector. Client's project planning and administrative capacity has been documented to be weak and inadequate. The business process review<sup>4</sup> indicates that the construction industry in Pakistan takes higher risks as it *spends a higher than average time in business processes relating to external verification, government and local government procedures, corruption, and local law enforcement agencies* than what is spent on the core project related interaction, documentation, verification and correspondence. Such risks are also often unmanageable.

27. Like in most developing countries, the inadequate growth of construction capacity, particularly the capacity to manage construction is a problem that public and private sectors in Pakistan need to face. The GoP and its public sector agencies have a double responsibility as principal client as well as creator of the broader business framework.