

An Action Plan to Promote Private Sector Participation in the Provision of Disaster-resilient Infrastructure in Bangladesh

Background

The Public-Private Infrastructure Advisory Facility (PPIAF) is a multidonor technical assistance facility, launched in July 1999 with the purpose of helping developing countries improve the quality of their infrastructure through private sector involvement. PPIAF supported an activity in Bangladesh with the long-term goal of strengthening the capacity of the private sector and of micro-finance institutions (MFIs) in particular, to invest in disaster-resilient infrastructure. At present, the Government of Bangladesh (GOB) faces budgetary and delivery capacity constraints in infrastructure provision, while demand continues to increase. Overall infrastructure investment is insufficient to meet the demands of a growing population and to support the expansion of productive activities. At the same time, existing infrastructure is not only in need of rehabilitation, but is also highly vulnerable to many natural hazards such as floods, landslides, river erosion, cyclones, and storm surges. In addition to the significant backlog that exists in basic infrastructure sectors such as telecommunications, transport and energy, existing facilities and infrastructure continue to deteriorate because of low standards in the construction phase, low maintenance levels and overuse, which increases their vulnerability to disasters. Not surprisingly, a high share of investments in infrastructure are lost to recurrent disasters, while scarce public funds have to be diverted time after time to reconstruction. Similarly to its role in

this domain in other countries, the private sector could play a central role in developing and/or managing infrastructure in Bangladesh, help improve infrastructure standards and reduce its vulnerability.

Due to their strong and extensive presence in Bangladesh, MFIs have great potential to fulfill this role. Despite the constraining financial and regulatory environment that still prevails in Bangladesh, MFIs have started, on their own initiative, to invest in several infrastructure sectors, notably telecommunications. Importantly, MFIs are aware of vulnerability to disasters and the need to invest in mitigation and prevention of losses, especially after playing a very effective role in recovery and rehabilitation of affected communities after the 1998 floods.

Vulnerable physically, socioculturally, economically and politically, Bangladesh is a fragile place. Its vulnerability is strongly linked to its poverty, an interconnection that is even more evident when poverty is understood from a broader perspective than income poverty. However, to date most of the recommendations for disaster mitigation have been made in the context of hazards, often following enormously devastating disasters such as the cyclone of 1971 or the floods of 1987 and 1988, and therefore have been largely structural in nature. While the importance of these structural measures cannot be underestimated, it is equally important to address vulnerability from a broader

perspective, and to consider recommendations that address the linkages between physical vulnerability, poverty, access and control of resources, and resilience and capacity. Given the unavoidably hazardous physical environment, an effective mitigation program will require an appropriate mix of structural and non-structural measures aimed at capability-building within the national government, better preparedness of the private sector, local governments and NGOs, and the provision of security, empowerment and opportunity for the people.

This current activity explores the possibility for promoting disaster resilient infrastructure and particularly for MFI investment in such through a literature review and desk study focusing on the vulnerability of Bangladesh to disasters and the role for MFIs to mitigate their effects, interviews in the field with various officials from MFIs and their apex organizations, and a conference that devoted one workshop to private sector participation and investment in infrastructure for disaster management, as well as a session on best practices from Asia. Some of this work was conducted in a parallel but complementary project funded by the Country Department and the Disaster Management Facility. See the report, *Focus on the Poor: Long Term Disaster Mitigation in Bangladesh* (World Bank, 2000a), and the *Conference Proceedings: Focus on the Poor. Long Term Disaster Mitigation in Bangladesh* (World Bank, 2000b).

Poverty Alleviation and Well-Being: the Contribution of Infrastructure

In recent times, the concept of poverty alleviation has broadened from the static concept of monetary income to include other dimensions of well-being which can enhance the quality of life and reduce the exposure to risks and external shocks for the poor. Infrastructure represents an important component of the strategy for addressing poverty in its broader terms. As noted in a recent Asian Development Bank report, “infrastructure services are necessary (if not sufficient) for poverty alleviation and broad, equitable economic development” (Asian Development Bank, 2000: 132).

Infrastructure and Poverty Reduction

The relationship between physical infrastructure and poverty has been well-documented. For example, lack of basic transport service is almost always associated with poverty. Without roads, the poor are not able to sell their products on the market. In India, it has been shown that roads alone account for seven percent of the growth in aggregate output of the rural areas. The retrospective evaluation of a feeder road project in Morocco shows that beyond its impact on agricultural production it was associated with a trebling in the enrollment of girls in primary schools. The use of health care facilities nearly doubled as well. Without electricity, the industrialization process, which provides the poor an important source of employment, is unable to take off. (Pouliquen, 2000). On the basis of a study of 58 countries, Binswanger showed that roads and irrigation had an important impact on many facets of rural

development. A 10 percent increase in the percentage of roads paved (used as a proxy for the quality of infrastructure) leads to a nine percent increase in the percentage in aggregate output, as does a 10 percent increase in the percentage of the area under irrigation (Binswanger, cited in Pouliquen, 2000).

The 1994 World Development Report, addressing the theme of infrastructure and development, emphasizes that providing infrastructure services to meet the demands of businesses, households and other users is one of the major challenges of economic development (p.13). The quality of infrastructure services directly determines the quality of life for a community and its productivity. The construction and maintenance of some infrastructure—especially roads and waterworks—can also contribute to poverty reduction by providing direct employment. Civil works programs, which often involve the provision of infrastructure, have also been important in strengthening famine prevention and providing income (World Bank, 1994).

As noted in a recent Asian Development Bank report, small and medium sized enterprises that provide infrastructure services may be the most effective at promoting poverty alleviation and local development. This is because these enterprises often produce employment and other economic benefits because of their linkages with other sectors and multiplier effects (Asian Development Bank, 2000).

Infrastructure and Urbanization

The provision of infrastructure services has become even more important in the context of growing urbanization worldwide. Investments in basic

infrastructure have not kept pace with urban population growth. Local governments lack the capacity to collect and dispose of municipal sewage and solid waste. Infrastructure bottlenecks and continued deficiencies in local capacity to manage and finance services hinder growth of productivity and investments in cities, and prevent them from acting as engines of growth. On the other hand, uncontrolled population growth, chronic poverty, and environmental degradation have increased urban vulnerability to natural and technological disasters.

Private Sector Participation in Infrastructure (PPI)

Until the early 1980's, governments or quasi-governmental agencies provided most infrastructure services, largely through vertically integrated, monolithic entities. Virtually no private telecommunications firms existed, and most early private railways disappeared with nationalization. Road construction came to be monopolized by public works departments in governments. The other services—water, sewerage, waste disposal—also tended to be both owned and operated by governments at either the national or the local level. The dominant public sector role in infrastructure provision has arisen for a number of reasons: recognition of infrastructure's economic and political importance, a belief that problems with the supply technology required a highly activist response by government; and a faith that governments could succeed where markets appeared to fail. However, more recent experience has revealed serious and widespread misallocation of resources, as well as a failure to respond to demand. Most of the infrastructure services offered by government agencies showed a common pattern of constraints and

limitations--operational inefficiencies, inadequate maintenance, excessive dependence on fiscal resources, lack of responsiveness to users' needs, limited benefits to the poor, and insufficient environmental responsibility (World Bank, 1994).

Private sector participation in infrastructure (PPI) began in the early 1980's in response to these challenges. More than 900 PPI projects globally got under way between 1984 and 1994—ranging from telecommunications in Cuba to multisectoral initiatives in countries as disparate as Albania and Colombia—and more than 2,200 are under preparation. The World Bank's lending operations have supported this worldwide PPI movement. In the period between 1988 and 1994 the Bank provided funds for more than 500 infrastructure projects—about a third of all Bank operations in this period. Of these projects, ninety-two contained significant PPI components, including the privatization of public utilities, on-lending to private sector operators, and franchising operations involving leases, concessions, and management contracts (Karaspan, 1995).

Investment in infrastructure projects with private participation has been concentrated in few countries, but it is spreading. The top 10 countries accounted for 97 percent of all private activity in infrastructure sectors in 1990, but they accounted for 70 percent by 1999. This decrease indicates that more developing countries are starting to embrace private participation. Since the mid-1990's, more than 50 developing countries have had new private activity in at least one sector each year and more than 10 have had new activity in three to four sectors each year. Though in the late 1990's infrastructure investment fell due to the East Asian economic crisis, the PPI in developing

economies will revive as they recover from the economic crisis and fundamental reasons for long-term private activity continue (Izaguirre and Rao, 2000).

Infrastructure Investment in Asia

The Asian Development Bank estimates that over \$1 trillion will be needed over the next decade to meet Asia's infrastructure investment. Energy and transport will require a combined total of \$450 billion, followed by telecommunications, water supply and waste disposal. Countries with major infrastructure requirements are: Bangladesh, People's Republic of China, India, Indonesia, Pakistan, Philippines and Thailand, and the nations of Indo-China (Asian Development Bank, 1995).

Infrastructure Investment in South Asia

In South Asia, all the countries have sought to promote PPI by ending government monopoly, introducing competition, and setting up regulatory institutions for many of these infrastructure services. However, progress is somewhat slow in attracting private sector participation. In India, which is the leading country in this region, public sector spending on infrastructure has fallen from 3.5 percent in the first half of the 1980's, and 4 percent in the latter half of the 1980's, to about 3 percent currently. However, this slowdown in public spending has not been accompanied with an increase in private investment. While the public sector's investment decreased by 1 percent between 1991-92 and 1997-98, the private investment rose from 1.4 percent to only

1.6 percent over the same period, so that overall infrastructure investment declined. Indians still largely receive infrastructure services-- such as electricity, telecommunications, ports and water—through public entities, which are part of government departments (World Bank, 2000d).

Specific Programs Addressing Public-Private Infrastructure Investment

A number of programs and initiatives have been created in South Asia to promote investment in and the development of various infrastructure sectors. Many of these programs are aimed at capacity building of the governments, the regulators and/or the providers of an infrastructure service:

Public-Private Infrastructure Advisory Fund (PPIAF)'s Initiative. In response to the challenges of promoting PPI in South Asia, the Public-Private Infrastructure Advisory Facility has funded a wide range of country-specific and multi-country advisory and related activities in South Asia in the following areas (see South Asian Forum for Infrastructure Regulation, 2000):

- Framing infrastructure development strategies to take full advantage of the potential for private sector involvement, such as assessing options for private sector participation in the water sector in Sri Lanka.
- Building consensus, and designing and implementing appropriate policy, regulatory, and institutional reforms, such as tariff approaches for electricity reform in Uttar Pradesh in India, and market approaches to providing telecommunication services in Nepal;

- Supporting the design and implementation of pioneering projects and transactions, as in the Sri Lankan railway sector
- Building government capacity in the design and execution of private infrastructure arrangements and in the regulation of private service providers, such as a workshop on the role of the private sector in infrastructure risk reduction in Bangladesh.

Forum for Infrastructure Regulation.

The South Asian region has 20 independent regulatory bodies already in place, and the number is increasing. To support capacity building of these regulatory bodies, the World Bank initiated the creation of South Asian Forum for Infrastructure Regulation (SAFIR) in 1999, in partnership with the Public Private Infrastructure Advisory Fund. The Tata Energy Research Institute (TERI) is a professional partner. Under the umbrella of the International Forum for Utility Regulation, this SAFIR initiative is guided by a steering committee of regulators from the region. The forum covers Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka, and is assisting to build regulatory capacity in the electricity, natural gas, telecommunications, water and transport sectors (South Asian Forum for Infrastructure Regulation, 2000).

Asian Development Bank and

Microfinance. There are other important initiatives in the South Asia region involving infrastructure and microfinance, which are very relevant in the context of Bangladesh. The Asian Development Bank has sanctioned technical assistance to the Government of India to meet the demand of the low-income groups for improved urban services through integrating the microfinance institutions (MFIs) with the major financial

institutions for urban and environmental infrastructure finance. The scope includes integrating MFIs in urban and environmental infrastructure development; capacity building for MFIs for urban infrastructure financing; identifying sample urban infrastructure projects; and providing training and workshops ((Asian Development Bank, 1999).

The Gujarat Mahila Housing SEWA Trust and the Water and Sanitation Program-South Asia recently completed a research initiative on microfinance for infrastructure and housing to poor women consumers in the informal sector. Their research demonstrated that microfinance is a growing sector with great potential for delivering infrastructure and housing finance to the poor to enable them to access improved water and sanitation services. Their project highlighted the critical importance of capacity-building so that community leaders can be trained in technical and maintenance functions (Water and Sanitation Program, 2000).

An Overview of Infrastructure in Bangladesh

This section presents an overview of the current state of infrastructure in Bangladesh, the need for infrastructure augmentation as projected by certain studies on Bangladesh, information on some of the infrastructure projects supported by multilateral agencies, and the diversification of Grameen Bank, the pioneer microfinance institution now also working in the telecommunications sector. Much of this information is drawn from a report prepared by the U.S. Department of Commerce, *Bangladesh: Economic Trends and Outlook* (1999).

Transport

The 36,000-kilometer primary road network is in relatively good condition (although it did receive extensive damage in some regions during the floods of summer 1998), thus supporting a substantial private trucking industry. The Jamuna Multipurpose Bridge, a massive engineering and construction project linking east and west Bangladesh for the first time, was completed in June 1998. There are numerous inland waterways. Inland water transportation accounts for about 65% of domestic cargo transportation and about 38% of inter-district passenger traffic, despite seasonal siltation problems and inadequate inland port facilities. Bangladesh's 4,364-kilometer railway system is in poor condition, hobbled by a mix of track gauges, widespread ticketless travel, and aged equipment. The Bangladeshi government is modernizing Dhaka airport and plans to expand Chittagong and Sylhet airports. Government-operated Bangladesh Biman Airlines runs a fleet of 9 aircraft, and some 17 airlines connect Dhaka with Europe, the Persian Gulf, and South, Southeast, and East Asia. Bangladesh saw two new domestic private airlines enter the market in FY98, GMG and Air Parabat. AnotAir cargo volumes, while still small, have been growing steadily over the last few years. (U.S. Department of Commerce, 1999.)

Power

According to the U.S. Department of Commerce report, Bangladesh's public power sector is inadequate and rife with corruption. Between 30 and 40 percent of electricity distributed to urban areas is never paid for. Overloading and a lack of maintenance cause frequent outages. Necessary planned blackouts, called

"loadshedding," are common occurrences throughout the country. The report also notes that damaged equipment, investments in standby generators, and lost production time caused by power irregularities and failures have cost some firms up to 30% of their value of production. The government has signed three agreements with private companies (two from the U.S.) to purchase electricity from power barges over 15 years; the first barge began delivering 110 MW of power to Khulna (in the western region) in September 1998. As of October 1998, a U.S. company, AES, had signed one contract with the government for a 360 MW land-based combined cycle power project in Haripur, and was negotiating another, of 450 MW, in Meghnaghat. UK-based MPI, a subsidiary of Cinergy (US), was the low bidder on a planned 100 MW power plant in Bagabhari, in the western region, and signed a letter of intent with the Government in the fall of 1998 (U.S. Department of Commerce, 1999).

Telecommunications

Also noted in the same U.S. Department of Commerce report is the fact that the country's telecommunications services are inadequate. The government-run telephone service has approximately 450,000 lines to serve 125 million people and a call connection rate of 30%. About 60% of the lines are analog and the quality of service is poor. The telephone service company is undermined by widespread corruption. Efforts are slowly under way to upgrade the telephone system, including expanding domestic and international capacity and installing digital exchanges. More private telecommunications firms entered the cellular telephone market in FY97; three companies now are operating with a fourth having a license. Combined

subscribers total 52,000. Several Internet service providers, featuring electronic mail and World Wide Web services, now exist in Dhaka (U.S. Department of Commerce, 1999).

Investment Projections for Infrastructure in Bangladesh

Several recent studies, prepared by various departments in the World Bank with collaborators in Bangladesh, have focused on identifying future infrastructure needs for Bangladesh, as well as recommending strategies for providing such services.

Bangladesh 2020, A Long-run Perspective Study (World Bank and Bangladesh Center for Advanced Studies, 1998): The phenomenal urban growth in Bangladesh will create huge demands for efficient land use, adequate housing, serviceable infrastructure, and responsive urban services. From a base of 24 million people in 1996, Bangladesh's urban population is expected to reach 30 million at century's end, about 50 million by 2010 and nearly 80 million in 2020. These projections are based on the assumption of an average annual growth of 6.4 percent up to 2000, 5.3 percent between 2000-2010 and 4.3 percent thereafter. Dhaka and Chittagong will be two urban megacities, with a population of 25-33 million approximately in 2020. These megacities and expansion of other smaller cities in Bangladesh will require a considerable augmentation of infrastructural facilities such as transport, telecommunications and power, and massive investment in these sectors. To meet the challenges of urbanization, this Perspective Study for Bangladesh suggests that the country needs to plan ways to:

- Upgrade its road system, especially with new north-south connections

around Dhaka and bridges facilitating traffic flow within and through other regions;

- Privatize railroad freight and, perhaps, inter-city passenger operations and find private partners to assist in revamping the inefficient national airline and preparing the airport at Dhaka to become a new regional hub;
- Rationalize port management, especially in Chittagong;
- Bring private sector participants prominently into the development of reliable energy supplies, especially from Bangladesh's copious reserves of low-polluting natural gas and from such renewable but less immediately accessible sources as solar and wind power;
- Emphasize well-regulated private competition to modernize telecommunications and then maintain and upgrade the technology Bangladesh must have to prosper in the information age.

Bangladesh, An Agenda for Action

(World Bank, 1997a): This document, prepared by the World Bank after the present government took over in Bangladesh, identified a course of action for improvement in infrastructure in Bangladesh. Its summary lists priorities as follows:

“To harness the plentiful reserves of natural gas and to cover the shortfall in power generation capacity, the Agenda argued that it was imperative that the country vigorously pursue private sector participation, implement a rational gas pricing structure and unbundle the integrated power sector. Furthermore, it was felt that lack of competition in telecommunication and the underdeveloped and poorly integrated transport system was hampering commerce and stifling the

growth of exports. While rationalizing of gas pricing structure remains elusive, increases in private foreign investment in the gas sector are materializing, though haltingly, through the mechanism of production sharing contracts. There is also discernible progress in private foreign participation in power generation on a BOO basis, with some movement towards unbundling of power transmission from generation; but no re-structuring of Bangladesh Power Development Board (BPDB) is in the offing.

Telecommunication privatization has begun with four private cellular companies currently in business; but basic telephone services remain a public monopoly under Bangladesh Telephones and Telegraph Board (BT&TB). The management of the country's major port remains precarious and a definite hindrance to trade and commerce. The apex task force, recommended in the Agenda, has not come about. The nation's road network is being expanded under the Road Master Plan of the Road and Highways department. A salutary development is the anticipatory approach introduced by Local Government Engineering Department (LGED) in planning, monitoring and maintenance of rural infrastructure”.

Rural Infrastructure Strategy Study

(World Bank, 1996): “Investments in Bangladesh's rural roads and markets in the past decade have provided a tremendous boost to agricultural productivity and the socio-economic well-being of people living in rural areas. However, more government and donor resources and greater community participation in rural infrastructure projects are needed to meet the country's

essential needs over the next ten years” (World Bank, et al., 1996).

This report--prepared by the World Bank in association with the Local Government Engineering Department (LGED) and the Rural Infrastructure Development Wing of the Planning Commission of the Government of Bangladesh--emphasizes that the development of rural roads and markets is a critical factor in increasing farm and non-farm employment and income, particularly for women and landless people in the rural areas and small farmers.

There is evidence from earlier studies that with better roads, transport charges dropped by 18.7 percent for cargo and 23.3 percent for passengers. Use of motorized vehicles has increased by 135 percent and the mobility of people has also naturally increased. Better transport facilities easily translate into better availability of agricultural services and products, access to educational and financial institutions, and increased trade. With improved markets, the average daily attendance, traffic of goods, and sales turnover have all increased dramatically (World Bank, et al, 1996).

Infrastructure Projects in Bangladesh

Primarily with support from a number of donor agencies, including the World Bank and the Asian Development Bank, a number of major infrastructure projects have been recently completed or are underway. One major microfinance institution is also investing in this sector.

Jamuna Bridge: Jamuna Bridge is the world’s 11th longest bridge across the Jamuna, the world’s fifth largest river, inaugurated in 1998. The Jamuna divides

Bangladesh, its roads and railways, and its population down the middle as it braids its way to the Bay of Bengal. What used to take an average of 12 to 36 hours to travel from Dhaka, using a combination of road transport and river ferries, takes only 6 hours. The 4.8-kilometer bridge also carries railway traffic and ties Bangladesh’s power and gas networks together into a national grid. The bridge thus integrates the economy, commerce, and communications more than perhaps any other physical investment has done. The World Bank provided an IDA loan of US \$200 million for the bridge. The Asian Development Bank and the Government of Japan also provided US \$200 million each for the construction of bridge.

Private Sector Infrastructure Development Project (PSIDP): The World Bank has approved a US \$235 million credit to the Government of Bangladesh for a Private Sector Infrastructure Development Project. Additional financing for this project has come from the British Department for International Development (US \$7.5 million) and the Canadian International Development Agency (US \$3.5 million). The PSIDP will establish a Private Sector Infrastructure Development Fund (PSIDF) to provide limited long term debt financing to selected energy and infrastructure sub-projects.

Under the project, technical assistance has been made available to GOB for transaction development and facilitation, capacity building, institutional development and for conducting feasibility studies, sub-project procurement and undertake sectoral reform initiatives. The Infrastructure Development Company Limited (IDCOL) and Infrastructure Investment Facilitation Center (IIFC) are the institutional windows for implementing

these components respectively. PSIDP assistance covers power generation and transmission, gas and gas related infrastructure, toll roads, water supply, urban environmental services, ports, telecommunications, and other basic infrastructure (World Bank, 1997b).

Bangladesh Dhaka Urban Transport Project: The World Bank is supporting this project aimed at improving urban transport in Dhaka. The project will cost US \$160 million. The transport problems facing Dhaka are multifaceted, making the project implementation difficult. It is important, therefore, to develop a phased approach and focus only on a limited number of objectives in this project to minimize implementation risks. The key project objectives are to: (a) reduce congestion and delays on the transport network in Dhaka city; (b) help develop a public transport system with a leading role for an efficient private-sector-run bus system, and retaining a positive role for the cycle-rickshaws; (c) strengthen the institutional, policy and regulatory framework; (d) prepare a long-term urban transport plan to cope with the future growth of the city in coordination with future land-use planning for the capital area; and (e) improve road safety and environment.

In addition to these on-going projects, some of the future projects which the Bank will support are: (1) Khulna Infrastructure Improvement Project and (2) Rural Transport Improvement Project. The Bank is also considering a Gas Infrastructure Development Project, which will support a 58-km gas transmission pipeline from Ashuganj to Bakhrabad connecting the North-South Pipeline to the Bakhrabad gas transmission system.

Asian Development Bank's Supported Projects: The Asian Development Bank has been supporting rural infrastructure such as roads, bridges, boat landings and markets in Bangladesh's poorest regions. It has implemented the first and second Rural Infrastructure Development Projects. The third such project has recently been approved by the ADB.

The Third Rural Infrastructure Development Project will benefit 14 million people in 13 districts in the north and northwest of the country. Heavy rains and floods leave the country's mainly earthen roads in poor condition. Roads are often built on embankments but lack bridges to cross waterways. The project will upgrade 1,250 km of feeder roads and build 4,800 meters of bridges. Waterways are another major transport mode and the project will build over 40 ghats (boat landing facilities). In addition, more than 170 rural markets will be improved.

The total cost of the Project is US \$181 million. The ADB has approved a loan of US \$70 million for this project from its concessional window (Asian Development Fund). Japan's Overseas Economic Cooperation Fund is considering financing of US \$50.7 million and the International Fund for Agricultural Development and the Swedish International Development Cooperation Agency are providing US \$11.7 million and US \$7.2 million, respectively. The Bangladesh Government will provide US \$36 million and local governments US \$5.4 million.

Grameen Phone: Bangladesh is internationally acclaimed for the strength of its microfinance sector. Microfinance institutions provide a wide range of financial and non-financial services to poor households, and operate a large network to provide these services. Their

financial strength and network can be harnessed to provide infrastructure services. Grameen Phone is an important example of a microfinance institution venturing into this area.

Grameen Bank established Grameen Telecom to manage the bank's interests in telecommunications, since a lack of communication facilities in the rural areas is one of the major obstacles to rapid economic development in Bangladesh. Grameen Telecom (GT) manages Grameen Phone with the goal of building convenient and cost effective communication facilities. Grameen Phone uses investments in expanding its own Global System for Mobile (GSM) network and also functions as a bulk reseller of time. Currently, Grameen Phone is a commercial operator with 25,000 customers, providing cellular services in both urban and rural areas. The goal is to expand this network, with at least 300,000 subscribers signed up nationwide by 2001 (Camp and Anderson, 1999).

Of particular relevance to the discussion of infrastructure provision, poverty alleviation and reduction of vulnerability to disasters is Grameen Telecom's village service. GT provides this service via a cellular payphone service or village payphones operated as micro-enterprises. The village payphone entrepreneurs are GB members who get the cellular phone for about \$375 under a GB lease finance scheme, for which the weekly payment is reportedly about \$5. This service is making information, among other things, more accessible to all village households (Bayes et. al 1999, quoted in Asian Development Bank, 2000: 128.)

Small scale Infrastructure Investment

A number of small scale investors have invested in various infrastructure sectors in Bangladesh, providing service at a level

that is accessible to the rural and the poor. Such services include community management of water points in Dhaka, providing access to safe drinking water for slum dwellers. The community bears the cost of installation and pays a security deposit for water points on city property. Currently there are 33 water points serving 250 to 400 users each. The success of the water points in providing access to safe water is due largely to the participation of the community (Solo and Snell, 1998, quoted in Asian Development Bank, 2000: 117). Also, low-income community centers for water, washing, and toilets have been established in Bangladesh for \$500 to \$2000 (deLucia and Associates Inc., 1999 in Asian Development Bank, 2000).

Infrastructure and Vulnerability

The work on poverty increasingly draws a distinction between poverty, a static concept measuring people's condition in relation to a threshold, and vulnerability, a dynamic concept measuring insecurity. Vulnerability is a particularly serious concern for the poor as it can push them into total destitution. Inadequate infrastructure increases vulnerability. The poor often live in the least desirable parts of towns and villages and are the first ones to be hit by natural disasters. Their farms are at the periphery of irrigated areas and are the first to be hit by drought. Their villages are isolated and access to medical support is difficult.

Hoque, in an exhaustive analysis of the link between electrification and fertility in Bangladesh, concludes that there is a very strong link between fertility and fertility-related issues and the level of

electrification, as shown in the following table:

Table 1: Link between Electrification and Fertility in Bangladesh

	Percent of Women Practicing Family Planning	Mean Ideal Family Size	Children Ever Born	
			Average	10-19 age group
Electrified households	46.6	2.67	5.15	.67
Non-electrified households in Electrified Villages	29.5	2.94	5.06	1.4
All Non-electrified Households	25.5	3.06	5.2	1.17
Electrified villages	40.6	2.77	5.12	1.00
Non-electrified villages	21.2	3.2	5.35	1.00
Overall	35.8	2.88	5.17	1.00

Source: Hoque 1998

While, overall, the figures on the total numbers of children born are similar with and without electrification, the difference for women in the 10 to 19 age group is much more significant. The figures indicate that the impact of electrification is essentially on the younger generations as older age groups straddle pre and post electrification periods and are less likely to change attitudes quickly (cited in Poliquen, 2000, p. 10-11).

The link between vulnerability and infrastructure manifests itself primarily in three ways: the effects of natural disasters, the effects of economic shocks and the inequality of access to infrastructure. In the context of Bangladesh, natural disasters are the biggest causative factor. Cyclones and floods strike Bangladesh

very frequently, and create serious dislocations for people and the economy.

The national economy of Bangladesh suffers a setback whenever there is a major disaster. The cyclone of 1971, which killed 500,000 people, is considered to be the worst disaster of the 20th century. The cyclone destroyed the infrastructure in coastal areas-- telecommunications, electricity, and roads. After that there have been intermittent floods, followed by the 1991 cyclone, which killed approximately 138,000 people. The Country Brief for Bangladesh prepared by the World Bank acknowledges the severity of impact the natural disasters have on the economy of Bangladesh. It states, "the people of Bangladesh benefited from the general improvement in the country's policy

environment, with growth in GDP per capita accelerating to 3.2 percent a year during 1991-98, compared to 1.7 percent during 1984-90. Indeed, per capita rates of growth in both periods would have been higher had it not been for the country's vulnerability to natural disasters, including the devastating floods of 1988 and 1998” (World Bank, 2000e).

The World Bank supported Bangladesh during these large-scale disasters, through

emergency lending projects and reallocation from the on-going projects in the country. Most of the Bank’s support was directed at the restoration of infrastructure and rehabilitation of the production sector. A list of participating agencies in different disaster recovery and mitigation projects supported by the Bank clearly shows the predominance of infrastructure in the Bank lending:

Table 2: Participating Agencies in the Bank-financed Disaster Recovery and Mitigation Projects

Sr. No.	Projects	Implementing Agencies in Bangladesh
1.	Cyclone Area Rehabilitation	Telegraph & Telephone department of the Ministry of Post, Telegraph & Telephone; Roads and Highways Directorate of the Ministry of Communications Ministry of Local Government, Rural Development and Co-operatives Inland Water Development Authority Fisheries Development Corporation Buildings Directorate Meteorological Department; and Reconstruction Board
2.	Rehabilitation Program Credit	
3.	Drainage & Flood Control	Bangladesh Water Development Board
4.	Small Scale Drainage & Flood Control	Bangladesh Water Development Board
5.	Drainage & Flood Control II	Bangladesh Water Development Board
6.	Flood Rehabilitation Credit	Roads & Highways Department Local Government Division Bangladesh Water Development Board Inland Water Transport Authority
7.	Flood Control & Drainage III	Bangladesh Water Development Board
8.	Flood Control & Drainage IV	Bangladesh Water Development Board (BWDB)
9.	Flood Rehabilitation II	Bangladesh Water Development Board (BWDB), Education Division of the Ministry of Education (ED), Local Government Engineering Bureau (LGEB) Roads & Highways Department (RHD) Bangladesh Inland Water Transport Authority (BIWTA)

		Bangladesh Telephones and Telegraph Board (BTTB)
10.	Flood Rehabilitation III	Bangladesh Water Development Board (BWDB), Education Division of the Ministry of Education (ED) Local Government Engineering Department (LGED) Roads & Highways Department (RHD) Bangladesh Inland Water Transport Authority (BIWTA) Bangladesh Telephones and Telegraph Board (BTTB)
11.	Coastal Embankment Rehabilitation	(a) Bangladesh Water Development Board & (b) Forest Department
12.	River Bank Protection	Bangladesh Water Development Board
13.	Arsenic Control	Ministry of Local Government & Department of Public Health
14.	Emergency Recovery Credit	Ministry of Finance

Source: Compiled from the Project Appraisal Documents and Implementation Completion Reports

The last major disaster that struck Bangladesh was the flood in 1998. The floods inundated two-thirds of the country, affected 30 million people, and caused over 1,100 deaths. They also severely damaged an estimated 15,000 kilometers of roads, and hundreds of bridges and culverts. The Bank provided an IDA loan of US \$200 million as quick-disbursing assistance to finance imports needed for rehabilitation. The Bank also worked with appropriate government agencies and other development partners to reprogram existing IDA-financed projects and those under preparation to provide for rehabilitation of damaged infrastructure and facilities (World Bank, 1998).

The ADB also provided emergency financial assistance totaling US\$137 million to repair vast damage caused by the recent catastrophic floods. The Flood Damage Rehabilitation Project aimed at restoration

of water supply and sanitation facilities in 27 municipalities, repair of schools and training centers, roads and bridges, flood and water control structures, embankments, rural roads and markets, railway facilities, and urban infrastructure including slum infrastructure (Asian Development Bank, 1998).

The international support from the multilateral agencies and donors in the wake of major natural disasters demonstrate the importance of infrastructure for rehabilitation and vulnerability reduction. In Bangladesh, the link between infrastructure and vulnerability reduction depends to a significant degree on the mitigation of the impact of natural hazards. Mitigating the risk of natural disasters is not simple, and it requires considerable investment and regulatory support. Developing risk reduction strategies involves essentially banning building in hazardous zones and

establishing design standards that can withstand the effect of natural disasters. It is not always easy in developing to establish these standards. Though Bangladesh has been able to develop a building code for seismic-resistant construction, it has not been able to enforce it. While the high cost of some mitigation measures like retrofitting may be a problem for Bangladesh, others, such as good roads, bridges, drainage, based on sound hazard-resistant design, are affordable and may go a long way toward preventing more routine problems such as those caused by flooding. Regular maintenance of roads is an example of a win-win strategy, which is both economically sound and critical to food security and famine relief. It is also equally important to tap the resources of private sector in Bangladesh to build and manage infrastructure. This paper thus seeks to provide a context for the discussion that took place in the international workshop in Dhaka on June 20-21, 2000.

Disaster-Resistant Infrastructure

The idea of private sector investment in infrastructure development for disaster management is quite new in Bangladesh, however there is a tradition of public/private management of infrastructure projects (Rabbani, 2000). As noted in the companion report, *Focus on the Poor: Long Term Disaster Mitigation in Bangladesh*, this is one of the most densely populated countries in the world and one of the poorest, with half of its population living below the poverty line. These conditions are not conducive to strong economic development, nor to investment in lifelines networks and permanent infrastructure, let alone disaster-resilient infrastructure. However, there are several

areas of infrastructure that are developing rapidly, and are beginning to recognize the importance of reducing vulnerability to disasters as they develop, specifically the water and telecommunications sectors, both discussed in more detail below. In addition, there is a strong connection between reducing disaster vulnerability and developing the transportation sector as well as building an effective multi-purpose shelter program, also discussed below. The potential role of the MFIs in investing in these sectors and in promoting disaster resistance is also discussed below.

Disaster Resilient Water Management

At the June conference discussing some of the issues of developing disaster resilient infrastructure, the Chairman of the Bangladesh Water Development Board referred mainly to the small-scale private sector, including community groups and individual entrepreneurs, and highlighted areas for potential participation of this sector in the construction, operation and maintenance, of physical infrastructures and provision of related services. He described a wide range of various issues related to water management for various natural disasters from flooding to drought, and pointed out that the public/private partnership in the development of water resources is important since this sector often requires large capital investment to generate economies of scale, justifying the presence of the public sector.

The chairman stressed that while water resources management requires the partnership of both the public and private sectors it also requires participation from the communities and individuals who benefit from the delivery of water-related services. In fact, the ultimate success and

effectiveness of public water resources management projects depends on people's acceptance and ownership of each project. In principle, community resources should be managed by the concerned communities, along with local government institutions.

The different areas of BWDB intervention in water management for disaster mitigation were listed, and the potential for private sector participation was identified for each:

Embankments:

BWDB has constructed a huge number of embankments for flood control, drainage & irrigation throughout the country. The preparation of Participation Guidelines to regulate people's participation in projects was started in 1994. Today they are almost ready, and the government encourages participation of the private sector in water sector projects, specifically in construction, operation and maintenance. New projects proposed by a community or local institution are considered for implementation on a priority basis and only when the beneficiaries have mobilized a certain percentage of the total costs as their contribution to the project. With regard to maintenance, local population/beneficiaries can participate for early detection of leakage, sliding, breaches in the embankments and repair on emergency basis. There are 4000 km of embankments and a huge potential to involve people in their maintenance. During emergency, like in flood time, local people can participate in strengthening the flood embankment, and save their lives & belongings from flood disaster

Sluice gate Operation:

Local population/beneficiaries can participate in the operation of sluice gate

and other drainage structure to minimize flood disaster hazards as well as water logging.

Coastal Belt Embankment:

Coastal belts are frequently affected by cyclones, tidal bores, tidal surge etc. Private sector investments and participation of stakeholders, with the technical involvement/assistance by BWDB's, can support the construction of embankments in the cyclone prone coastal belt and offshore islands (where technically feasible).

Afforestation:

Private sector investment and beneficiaries participation is very effective in afforestation of cyclone prone coastal area. Private sector investment and participation in afforestation have already been proved very effective and profitable in Bangladesh.

Small river, Canal excavation and re-excavation:

Sedimentation is one of the major problems for rivers and canals in Bangladesh. Every year huge sediment deposits in the river beds reduce largely their flow capacity. Here there is a potential for people's participation in excavation/re-excavation under food for works program/voluntary service as this would also help to create new jobs in periods of need (emergency).

Cyclone Shelter:

There is need for more cyclone shelters and this is another major potential area for participation of the private sector. A good number of Cyclone shelters are already successfully in use as multi purpose buildings in cyclone prone coastal belt and offshore islands. Such multi purpose cyclone shelters proved very effective during cyclone. The total number

cyclone shelters is quite inadequate, and private sector participation (both in construction & maintenance) can play very effective role in this sector.

Hydropower generation:

Bangladesh has limited potential for hydropower generation due to its flat terrain and the absence of suitable reservoir area. However, it could be possible to build mini hydropower plants at small dam and barrage sites. These schemes have potential to attract private sector investments and could be managed by people's micro-enterprises in partnership with local government development agencies.

Preservation of Haors, Baors, and Beels:

Water bodies like *haors*, *baors*, and *beels* are unique regional characteristics of Bangladesh, and they have great economic and environmental value. In fact, even during extremely dry seasons, when the smaller *beels* turn into quagmires, the *haors* and *baors* retain considerable amount of water. These water bodies account for a large share of natural capture fish and provide a habitat for a wide variety of aquatic vegetation and birds. Micro-enterprises of local communities could be successfully involved in the management of these traditional water sources.

Flood Disaster Forecasting and Warning by FF&WC of BWDB:

A special unit within the Bangladesh Water Development Board (BWDB) is the Flood Forecasting and Warning Centre (FFWC), in charge of generating flood related information and disseminating warning messages to the people in flood prone areas. FFWC faces a real issue related to the effective dissemination of timely warning at village level. This area create a great potential in

for the participation of Private Sector, above all in the sector of telecommunications and in the setting up of effective systems for timely warning.

Disaster Resilient Telecommunications

Also discussed at the June conference in Dhaka was the importance of the telecommunications infrastructure sector as an indispensable tool for disaster preparedness and management, and for co-ordination of international and national responses to disasters. One presenter discussed how modern telecommunications have the potential to create new jobs, and have important social implications, given how drastically they change the way people communicate and access information (Rahman, 2000). He introduced the concept of GramTel (*Grameen* –village- Telecommunications), village communication centers based on the use of modern telecommunications to provide innovative low-cost services to people in rural areas. Some examples of GramTel services include:

- Data processing services and shared telephone numbers (voice-mail box) offered by Public Call Offices (PCOs) managed by small-scale private sector entrepreneurs.
- Use of Cyclone shelters as community Public Call Offices (PCOs), managed by the community or by private small-scale entrepreneurs. This would guarantee an efficient service coupled with proper attention to operation and maintenance, which are typically very poor for public telephones.
- Tele-education to deliver educational programs to remote locations. This service would contribute significantly to the reduction of inequality of opportunity between regions. Tele-

education could bring live classes held in cities to schools located in cyclone shelters and rural areas.

- Tele-medicine could help to reduce costs, and increase efficiency of healthcare, improving also the quality of service provided by Community Clinics.
- Telecommunications for information dissemination: by transporting information, in written, spoken, visual and electronic form, telecommunication could become a viable substitute for transportation of goods or people.

It was pointed out that telecommunications are a cost intensive industry, above all considering that economic conditions in rural Bangladesh are too poor to provide cost effective returns for such investments.

Nevertheless, developing telecommunications for communities is possible. It requires appropriate technical, financial, commercial, and policy planning and the combined effort and partnerships of government, non-government organizations, financial institutions, the private sector and communities (Rahman, 2000). By building such partnerships it is possible to the telecommunications sector in such a way that it addresses development needs and is itself a disaster resilient infrastructure that can then play an important role in reducing disaster vulnerability as well as providing service during disaster situations.

Disaster Resilient Transportation Networks

Another sector of infrastructure that was identified as developing and with the potential to address issues of disaster resilience was transportation. The private sector plays a role in the construction of transportation projects and could certainly

incorporate more knowledge about vulnerability reduction in new construction. Typically disaster and vulnerability reduction have not been considered in the design of new construction projects, and with more education, awareness and resource investment this could be changed. There was specific discussion centering on the role of the private sector in the provision of disaster-resilient roads and infrastructure. In the past it was customary that the village government body (and the villagers) would dig and maintain canals. Today, there is a need to mobilize more local participation and finance. This is a new sector, since people are used to borrowing for subsistence and not for development, and it requires a shift from micro-credit to micro-finance. During the flood in 1998, roads were heavily damaged due to bad design (they were not disaster resilient) and lack of maintenance. Disaster is not taken in consideration when designing infrastructure, and people are used to wait for the government to maintain roads. In Bangladesh new ideas are emerging to raise funds for O&M, like having toll roads. There are some examples in the country which demonstrate that, even if travelers can take alternative routes, they prefer to pay the toll and travel on a safer and well maintained road.

Another option to be further explored is the potential revitalization of traditional transportation like toll navigation routes, which are all over the country and still surround Dhaka. A current project under development has more than 100 kilometers of navigable river course, and will support water traffic connected to India, which will reduce the load on road transport. This project is being implemented by the government, but the operation and maintenance could be under a public/private partnership, with

cost recovery and revenue components (like leasing side platforms, etc.). In Dhaka there is a project to explore the possibility of using the water bodies surrounding the city as water routes. Slowly the private sector is getting interested also in drenching canals/ rivers, while embankment projects could include a component for construction of roads on the top edge of the embankment. There is such a project coming up, a 2,500 crore project with cost-sharing with the private sector. The new embankments will be designed to also provide the basis for roads. Later on, private firms will use the embankments to build flood-resilient toll roads.

Multi-Purpose Community Cyclone and Flood Shelters

After the severe cyclone of 1971, which took over 300,000 lives, a number of shelters were constructed in coastal areas, many funded by donor agencies, including the World Bank. During the ensuing years a number of problems were identified with these shelters, including that they were not sufficient in number and not properly designed or located. In another devastating cyclone in 1991 some shelters were unused because access roads were flooded early. A number of public buildings could have been built as shelters but were not; in 1991 many public buildings were used as shelters even though that was not their intent. In addition, there was no provision for food or water in the shelters, nor any provision for livestock or poultry (UNCRD, 1991).

After the 1991 cyclone the government appointed a task force to prepare a master cyclone shelter plan (Choudhury, 2000). Working in tandem, the Bangladesh University for Engineering and Technology (BUET) and the National

Institute for Economists and Social Scientists (BADS) developed planning, design and construction recommendations for the 700 kilometers of coastal area. While shelters had started to be constructed after the 1971 cyclone, there were only about 226 in place at the time of the 1991 cyclone. This study identified a need for 4000 shelters total. The study identified that 40 percent of the existing shelters were built where they were not needed, and that 40 were in fact outside the high risk area. The study recommended multi-purpose shelters that could function as community buildings, health clinics or schools in addition to shelters (for example, the second floor could be a school, third floor a health clinic). Community maintenance of the shelters would also help in ensuring they did not fall into permanent disrepair. After the 1991 cyclone, the construction of 360 shelters was supported by the Saudi government. Using the guidelines developed as part of this master plan another 300 to 400 shelters have been constructed. The location, maintenance and design of cyclone shelters remains an important and controversial issue in Bangladesh; the government is currently seeking international funding support for a large-scale construction program to augment the existing number of shelters.

A recent Oxfam report indicated that there are particular problems for women and children in existing shelters, and stated “the vulnerability of communities living in the most disaster prone char areas need to be reduced by the construction of community-managed, women and children friendly flood shelters with basic water and sanitation facilities. Village committees, mandatorily comprising at least 50% women, [should] decide on the location of these shelters and will manage their construction and subsequent running” (Ahmed, 1999: 9).

At the June 2000 international conference in Dhaka much discussion centered on the possibilities for involving the private sector in financing the construction of the shelters. In this way shelters could be built and regularly used by the private sector, and available to communities during periods of emergency, avoiding the issue of single use buildings that fall into disrepair and are then unusable when needed. (World Bank, 2000b).

The Unique Role of the Microfinance Sector in Bangladesh

Bangladesh is unique in the world in terms of the active involvement of NGOs and microfinance institutions (MFIs) in poverty alleviation. In fact, the potential of MFIs to help break the poverty-vulnerability-disaster-poverty cycle has become increasingly evident, especially given their growing involvement in disaster management coupled with reduction of social and economic vulnerability. The country has a long tradition of microcredit finance, which has been broadened to include savings and some insurance products, and more importantly, to offer additional services and resources to the poor such as training, skill development, family planning and health services, housing, education, and peer support, among other things (Karim and Osada, 1998). The success of the Grameen Bank, considered a pioneer in this approach – often referred to as the ‘credit plus’ or trickle up approach – is very well known and has been replicated across the world. Building on this experience, most MFIs today recognize that merely providing credit to the poor will not suffice, and that it is also essential to provide supportive non-credit services

such as the ones described above (Pitt and Khandker, 1998). MFIs have also played a major role after natural disasters such as the 1998 floods, and have identified the need to play an even stronger role in disaster management (Proshika, 1998).

MFIs are considered to have the potential of playing an important role in promoting infrastructure development, particularly small-scale infrastructure, because of their actual and potential role in physical, social and economic vulnerability reduction, and their prominence at the community level. Grasping the magnitude and structure of the microfinance sector in Bangladesh requires as precise a definition of MFIs as possible, and a clear understanding of their relative position within the larger financial sector of the country. Such task, it must be noted, is not an easy one. As Karim and Osada (1998: 259) correctly point out, “[n]ow almost all government, semigovernment and international, national, and local NGOs engaged in poverty alleviation efforts have included microcredit as the major component in their programs.” Drawing the line separating the poverty alleviation activities of ‘traditional’ NGOs from those of self-declared MFIs is not always possible. Between 800 to 1,000 organizations are said to be providing poverty-focused microfinance programs, with a total coverage of about 8 million people, most of whom – over 80 percent – are poor rural women (World Bank, 2000c; 1999). These estimates include a wide

Table 3
Structure of Microfinance Sector in Bangladesh

Sector and Institutions	Microcredit Disbursement 1994-95 (Tk Million)	% of Total Disbursement	No. of Borrowers in 1994 (000)	% of Total Borrowers (a)
Formal Financial Sector				
Grameen Bank	15,000	70.80	1,861	39.80
Bangladesh Rural Development Board (BRDB) (b)	1,647	7.80	521	10.90
Nationalized Commercial Banks (NCBs)	104	0.50	n.a.	--
Sub-total Formal Sector	16,751	79.10	2,382	49.80
Semi-formal Financial Sector				
Association for Social Advancement (ASA)	1,156	5.50	386	8.10
Bangladesh Rural Advancement Committee (BRAC)	2,035	9.60	706	14.80
Proshika	423	2.00	417	8.70
PKSF's Partner Organizations (POs) or MFIs	675	3.20	290	6.10
Swanirvar	132	0.60	598	12.5
Subtotal Semi-formal Sector	4,421	20.90	2,397	50.20
Total in Tk Million	21,172	100.00	4,779	100.00
Total in US\$	520			

Source: World Bank, 1996

(a) Excluding the NCBs for which there were no available data, but whose share is relatively small.

(b) This refers mainly to the Rural Development Project-12 (RD-12) of BRDB.

variety of organizations ranging from small NGOs that have taken on a lending component to medium and large organizations, many of which were created primarily to provide microcredit but that also offer other financial and non-credit services. Not only is there a wide range in the scope of services offered by MFIs, but also a significant variation in their objectives, methodologies and type of programs. On the one hand, there are institutions like Grameen Bank and the Association for Social Advancement (ASA) whose operations lean more toward credit activities. On the other hand, there are organizations such as the Bangladesh Rural Advancement Committee (BRAC) and Proshika that follow a broader

strategy, focusing more on community and human resource development (World Bank, 1996).

Bangladesh's financial system is small and undeveloped, and hampered by an inadequate legal framework, poor governance and a weak central bank (World Bank, 1999). As Table 3 above shows, a formal and a semiformal sector comprise the financial sector of the country. In addition, there are informal mechanisms or institutions such as family, friends and moneylenders that are still relevant as sources of finance, principally in rural areas. This informal financial 'sector,' however, is unable to satisfy the credit needs of the poor. In a high-risk natural and economic environment such

as Bangladesh, informal lenders are as keen to screen borrowers as are formal institutions, while the poor cannot usually afford the high interest rates requested by this type of lenders.

The formal financial sector is integrated by about 15 commercial and specialized banks and two cooperative networks (World Bank, 1996). The public sector financial institutions, including nationalized commercial banks (NCBs) and specialized banks, have not been major sources of credit for the rural poor, despite having had relatively large rural credit programs and having started some microcredit programs. Whereas NCBs are highly regulated, with clearly stipulated non-negotiable interest rates, private banks have for the most part shied away from the rural credit sector. In general, apart from some individual schemes, the formal rural banking institutions have concentrated on lending to collateralized businesses and farmers. Credit for enhancing agricultural production through green revolution technology and especially irrigation was emphasized throughout the 1980s. Despite significant successes in this agrarian strategy, the national banking system was unable to replace a substantial informal financial market, and failed to address the needs of the non-farm microenterprise sector. In fact, the institution from the formal financial sector that has most effectively targeted and reached the rural poor is the Grameen Bank, which started as an NGO in 1976 but was formally established as a specialized bank in 1983 (Karim and Osada, 1998; World Bank, 1996). Today, Grameen Bank is the largest provider of microcredit in the country. It has about 2.35 million members – up from 1.86 million in 1994 – of whom about 95 percent are women; these members are reached through 1,118 branches and centers in 38,766 villages (Grameen Bank,

2000). In comparison, the Rural Development Project-12 (RD-12) of the Bangladesh Rural Development Board (BRDB) has about 0.5 million borrowers (World Bank, 2000c).

The growth of MFIs has been spurred by the urgent need to provide the rural poor with access to credit and finance. Grameen Bank took the lead and soon other organizations followed, which has quickly given shape to a semi-formal financial sector (see also Table 3 above).¹ In many cases programs originally developed as disaster-relief assistance have evolved into well-known MFIs such as BRAC (Nagarajan, 1998). Other relevant MFIs comprising the semi-formal sector are Proshika and ASA, which along with Grameen Bank and BRAC are leading providers of microcredit programs in the country.

A close look at Table 3 shows that the structure of the microfinance sector is bipolar. This is made particularly evident by the fact that the leaders in the sector, namely Grameen Bank and the large MFIs mentioned above (BRAC, ASA and Proshika) cover over 95 percent of the microfinance market. These are the most influential, professionally managed and staffed institutions that capture most of the grants given by foreign donors. Usually, their annual credit programs range between Tk 0.4 and 2.0 billion (World Bank, 1996). The remaining 5 percent market share belongs to smaller, more local MFIs whose annual credit programs range between Tk 1 and 100 million, and that must rely on the Palli Karma Sahayak Foundation (PKSF) for funding. Among this category, there are a

¹ Not surprisingly, most credit programs for the poor in Bangladesh have now adopted the main lessons from the Grameen Bank's pathbreaking work (Montgomery et al., 1996)

large number of more marginal MFIs, with a membership of about one million people (or 15 percent of total microfinance borrowers). These MFIs do not belong to the PKSF network, and are so small and remotely located that cannot manage to establish enduring relationships with donors (World Bank, 1999).

In general, the unique organizational and operational characteristics of MFIs have allowed them to overcome traditional barriers to providing credit to the rural poor. MFIs have thus far managed to provide with relative success credit and capital to set up microenterprises. They have also simultaneously addressed the inability of the formal banking system to provide credit to the poor on a non-collateral basis, and the limited ability of the informal financial markets to meet the credit needs of the majority of the rural poor (Khandker, 1998; Hulme and Mosley, 1996).

Microfinance institutions have developed capabilities in terms of resources, networking, expertise in development, and mediation between the poor and the government. These capabilities have proven useful during and after disaster situations, which in Bangladesh happen unfortunately quite often. The recent experience of the 1998 floods has shown that the MFIs can successfully help stabilize and smooth consumption levels among low-income communities affected by disasters. The MFIs have also come up with special products and financial services that help the poor in maintaining their subsistence levels during emergency situations. Thus far, however, MFIs have been mostly focused on post-disaster situations, and mainly relief and other emergency response measures, as well as recovery.

Potential for MFI Investment in Disaster Resilient Infrastructure

The potential of MFIs to contribute across all the phases of the disaster management cycle, and especially in community-based disaster prevention and mitigation, including disaster resistant infrastructure, has not been fully exploited yet. Income generation, diversification of asset base and housing improvements are some of the examples of prevention and mitigation measures that MFIs are already supporting. But MFIs' role could still be larger. For instance, insurance is a newly emergent area where MFIs could play an important role in facilitating risk pooling. The market for savings-based insurance remains largely untapped, but the MFIs need expertise, financial support, and effective linkages with the formal insurance and reinsurance sector to expand their coverage in this area. An active promotion of savings-based insurance and other special financial services would provide MFIs with more resources, expertise, and clout in disaster risk reduction and mitigation.

Microfinance represents a key mechanism to promote community-based disaster management. Some measures to enhance the effectiveness of microfinance in this respect may include targeting mitigation through the creation of specific funds: a social fund; a disaster fund in the PKSF for refinancing MFIs so that they can support recovery and mitigation activities; a housing fund so that they can support structural mitigation; and an insurance fund to support microinsurance.

Create Social Funds

One important way in which MFIs could promote and invest in disaster mitigation at the level of community infrastructure is

through the creation of social funds. These funds support small projects ranging from house construction and repairs to the development of community infrastructure, social services, and training that are identified as mitigation activities by the community and presented to the social fund for financing. Several social funds could be set up in hazard prone and vulnerable areas with the specific objective of promoting disaster mitigation, specifically disaster resilient infrastructure. The government, microfinance institutions, and NGOs can take the initiative in setting up such funds. The funds could be in the form of both grants and loans, depending upon the nature of activities. Loans, carrying a low rate of interest, might more appropriately address consumption needs, crop farming, and housing improvements. Grants can be used for community-based activities, such as health services, training and education.

Such funds would also provide a vehicle for directly linking poverty alleviation and disaster mitigation. As noted in the complementary study, ***Focus on the Poor: Long Term Disaster Mitigation in Bangladesh*** (World Bank 2000a), poverty is broader than lack of income, and these funds provide the opportunity to address other components of poverty, such as lack of education or access to health care. It is important to involve the communities themselves in the management of social funds so that they can more directly ensure the entitlements of the poor in terms of livelihood, habitat, and community development.

Create Targeted Programs for Disaster Mitigation

Specific financial services could be provided to the poor to support disaster mitigation, particularly by encouraging the

development of small scale infrastructure. The first step in providing these financial services is the recognition within the government of the need for such resources. Providing such resources requires strengthening of financial institutions, developing and testing products and services, education and awareness of the private sector, and creating awareness about the availability of these services. Government policy initiatives and supporting institutional development can facilitate a greater acceptance of these instruments among financial institutions and the people. The government can create specific targeted programs with the leading financial institutions of the country, which in turn can strengthen MFIs and other community-based organizations to carry out disaster mitigation activities:

Strengthen the Central Disaster Management Fund within the PKSF

The PKSF, set up by the Government of Bangladesh in 1990, can play a significant role in financing disaster mitigation. It gained substantial experience after the 1998 flood in post-disaster financing; much of that experience is directly translatable to promoting and financing mitigation. Since it provides refinancing to the MFIs, along with recommending norms and standards of financial management, its role could be central in developing a number of services and products related to disaster mitigation. The first step in providing more extensive financial services would be to strengthen the Central Disaster Management Fund, establishing it as a formal facility, created statutorily. Such a fund was created in an ad-hoc manner after the '98 floods, providing the partner MFIs with access to refinancing. A formally created fund could pool resources from the PKSF itself, the

Government of Bangladesh, donors, and partner MFIs. Nominal contributions from the individual members of the MFIs could also be used to build this fund. Some of the features of such a Central Disaster Management Fund might include:

- A formal framework for the use of these funds. The guidelines would include eligibility of the MFIs for accessing refinance, refinancing limits, the repayment schedule, and the rate of interest.
- Parameters defining the transactions between the MFIs and the borrowers, including the different categories of loans, the maximum amount available under each of these categories, the repayment schedules and the interest rate.
- The ability to activate lending immediately upon the onset of a disaster.
- Support for specific disaster mitigation activities.
- A provision to replenish the fund through regular contributions from different sources and repayment. It is important that the Fund be adequately capitalized.
- The ability for member MFIs to set up their own local Disaster Management Fund Accounts and to operate these funds according to guidelines developed by the PKSf.
- Support the development of innovative services and products, related to disaster management and piloted on a limited basis.

Create a Housing Development Fund within the Bangladesh Bank

The Bangladesh Bank has started a housing construction loan program for

those affected by river bank erosion. The Bank charges interest at the rate of 1 % per year, and the MFIs lend money to the clients at the rate of 5 % per year. The borrower is to repay the loan over a period of 20 years. Though a number of important MFIs such as Proshika participate in the program, there is some concern about repayment rates. However, because housing is a basic need, and disaster-resistant housing in particular is an important element of mitigation in a country so prone to flooding, river bank erosion, cyclones and other disasters, a targeted program such as a housing development fund must be set up either within the PKSf or the Bangladesh Bank. Because the MFIs have not had good experiences to date with their housing portfolios, the creation of such a program would require policy research and extensive consultation with the MFIs. Such research could identify segments of the population and geographical areas where housing loans could be most effective in terms of promoting mitigation and reducing vulnerability. A certain portion of the fund could be used to help house-owners improve their houses, including raising their plinth levels, strengthening walls, repairing roofs, and replacing bamboo and wooden materials used in the houses. There are several options for how such a housing development fund could operate:

- Small amounts could be made available to individuals on a loan basis.
- Self-help groups or a cluster of families could borrow the money as a group and then have members of the group or families work on each others' houses, reducing the cost of construction or repairs.
- The MFIs could offer incentives linked to repayment. For example, partial insurance for the house could

be linked to the repayment installments of the housing loan. Other incentives could also be explored, such as encouraging the MFIs to contribute to the building of small community infrastructure projects, such as village roads or embankments, or a shelter if a large enough group in a village borrowed the loan.

Assistance for housing also implies technical and material support; these services could be provided either through the government or the NGOs. Demonstration houses with hazard-resistant features could be constructed, and building resource centers could be set up in vulnerable communities. These building resource centers could disseminate information on indigenous strengthening techniques, act as networks for communities interested in borrowing housing loans, and provide manuals or other materials to explain how to reduce hazard vulnerability.

Provide Financial Services

The various activities currently examining disaster vulnerability reduction in Bangladesh all emphasize the link between poverty and vulnerability, and between poverty alleviation and vulnerability reduction. Providing security through selected financial mechanisms available from the private sector or MFIs is one strategy to reduce vulnerability. Developing targeted programs for mitigation represent another important strategy to provide people with the resources needed to reduce their vulnerability to disasters. Directly providing people access to finance through savings, credit, and insurance is yet another important strategy to alleviate poverty and thereby reduce vulnerability.

At present, the MFIs in Bangladesh provide these basic services, with the largest emphasis on providing credit. As the MFIs evolve and become stronger financial organizations and more sophisticated in their functioning, they can be expected to provide a more diverse range of services. Savings, credit and insurance can be complementary instruments, and they can be used either individually or in combination to reduce vulnerability and risks associated with natural hazards. These instruments reduce vulnerability in several ways: 1) they can, individually or in combination, be used to generate resources that reduce vulnerability (by providing credit, for example, to strengthen one's home); 2) they are used to alleviate poverty, and the less poor are more resilient to natural disasters; 3) they can directly reduce the impact of disasters and improve coping capabilities by smoothing consumption at the time of disaster; and 4) they can transfer risk to a third party. The development of these specific instruments as mitigation tools will require the active support of the private sector, government, donors, and regulating institutions. Each of these three instruments are discussed below:

Promote Savings

While savings services have been most useful at the time of disaster, and could be developed further as a disaster coping mechanism, they can also be targeted to more specifically address individual mitigation needs by building assets. First, during disasters, savings are, and could be made more, available by the MFIs to their clients. To increase the effectiveness of these savings during disaster times there needs to be flexibility in how the savings are collected and managed. Members, for example, could be allowed to deposit money any time or in any amount,

without having to make fixed compulsory savings. The frequency of collection could be increased, providing people with more savings opportunities and encouraging them to spend less on dispensable needs. Similarly, members could withdraw their savings when they need it. Their savings need not be collateralized for the loans they receive. The MFI in Dhaka, SafeSave, could cope better with the floods there due to its very flexible savings schemes. Open access to savings does not necessarily reduce deposits, as people prefer to retain their savings as much as possible, and withdraw it only as a last resort.

There could also be time deposits with the provision of contingent withdrawals. These contingencies could be defined, and accordingly the people in these situations could withdraw a specified percentage of their savings. A good interest rate and a need-based interest payment could also function as incentives for increasing savings.

Savings are the most important financial service for vulnerable groups. Many among the poor and vulnerable prefer savings to credit, as it does not obligate them to making repayment, or to taking loans from other informal sources to pay loan installments. The poor may prefer the savings route for building assets and use it as a self-insurance mechanism. The propensity to save exists among the very poor too, and longer they save, the less vulnerable they are in managing their risks. Savings can also help the MFIs as it enables them to tap the resources of the non-clients and provides them the necessary capital. So the savings emerges as a very strong instrument of risk reduction, provided there are adequate opportunities and incentives for encouraging it. Recently, the MFIs in Bangladesh have started emphasizing

savings activities, and have made it more flexible and accessible to their members.

Extend credit

Of the three kinds of financial services extended by the MFIs, credit has been used most extensively to provide assistance during disasters. Its link to mitigation, while not as developed, is also strong. The MFIs during the 1998 floods re-scheduled debt repayment and provided emergency loans to tide over borrowers with immediate consumption difficulties. The MFIs have now adopted these strategies as standard financial practice. Re-scheduling loans provides the borrowers temporary relief during the lean periods that accompany disasters. The MFIs also recognize the need for emergency loans to their members during disaster situations. Some MFIs do not charge any interest on these short-term loans, while others seek to recover their operational costs by levying a five to six per cent rate of interest on these loans.

MFIs could also play a much stronger role in supporting mitigation through their loans, and in helping their members prepare for disasters. Loans could be made to individuals or groups of individuals for building or strengthening a house, purchasing a boat, or constructing a community shelter, among other activities. These loans improve the capacity of the members to cope with disasters, and minimize the loss of their income. Some of these loans could be given through the targeted programs described above. However, it is important to recognize that these loans are given in addition to loans made for the purpose of income-generation, and the combined burden of repaying these loans should not exceed the limited capacity of the members to repay.

Loans are also required for the purpose of rehabilitation after disasters, and mitigation or reduction of future risk could also be introduced at this point. Households typically use these loans to restore levels of income and assets to the pre-disaster stage. However, in most situations, members are overwhelmed by disasters, and they are not in a position to take on more credit. The MFIs are also circumspect in providing asset replacement loans, as it should not overburden the borrowers. So while the role of credit can be very important for asset building in pre-disaster period, or for meeting the consumption needs in the wake of a disaster, there is always a risk involved in overusing this instrument, a risk of which both the MFIs and the borrowers are aware.

Provide Insurance

Insurance is an emerging financial service for the MFIs, and while not a strategy that can directly reduce potential loss or vulnerability, it represents an important strategy in terms of transferring risk. While life insurance has become a part of the financial services of a number of MFIs in Bangladesh, extending insurance to health and property poses a serious challenge. Group-based insurance programs, mutual insurance, and similar community-based insurance products may offer the best potential for transferring the risk associated with natural disasters and protecting individuals from loss of all assets. Group-based insurance programs increase the size of risk pool, and makes disaster risks more insurable. In addition, insuring a large number of clients, generally members of a family, village, or enterprise with a single policy rather than separate policies for each individual brings down the cost of delivery and administration, and makes it more affordable for the participants. If the

group is sufficiently large and homogeneous, the problems of adverse selection, and to a great extent, that of moral hazard can be avoided.

As disaster risks are pervasive in Bangladesh, and any disaster affects a large part of the country at the same time, the insurability of these risks is very difficult. An insurance program covering these covariate risks would require much experimentation and the development of pilot products. The MFIs would need actuarial expertise, financial support, and an effective linkage with formal insurance and reinsurance sector to expand into this area. A certain amount of subsidy for the premiums, as is the case in the insurance scheme run by SEWA in India, may also be necessary. The government could also investigate setting up an insurance pool through which these special insurance products could be supported on a limited basis. The possibility of providing insurance to small commercial enterprises for business interruption due to natural disasters should also be investigated—such as grocer, carpenter, handicrafts worker, rickshaw puller, etc.

A number of insurance schemes are currently linked to the credit programs offered by the MFIs. These insurance programs are designed primarily to protect the MFIs' portfolio. It is important that a market in savings-based insurance is created. While it will promote savings, the insurance coverage can also be increased in proportion to the type and amount of savings.

The MFIs in Bangladesh have found the life insurance benefits financially feasible. Based on their experiences, they can increase the range of benefits for health and property gradually. Insurance, however, is a new stream of financial services for the MFIs. If the MFIs offer

insurance in collaboration with the insurance companies, they can get the actuarial expertise and financing needed to develop micro-insurance products. On the other hand, the insurance companies will gain access to millions of the MFI borrowers and a great deal of local information, which can be very helpful in designing particular products for potential customers. For most MFIs, a Partner-Agent model, in which an established insurer provides actuarial expertise and financial resources, and MFIs provide their networks for distributing and servicing policies to low-income communities, may be the preferred starting point for composite insurance policies. It eliminates the MFIs' risk yet allows them to offer insurance benefits to their clients.

Future Directions

It was pointed out at the June conference in Dhaka that guidelines currently under preparation will directly address the issue of private financial participation in infrastructure. Specifically, the People's Participation Guidelines will identify and guide such private financial participation in water management projects (Rabbani, 2000). It will divide projects into three major categories (Small, Medium and Large) and require, for example, that, for irrigation projects up to 1000ha, the responsibility of operation and maintenance be transferred to local institutions and community groups. The Water Development Board will be responsible only for physical and capital investments, but not for maintenance. Another option under consideration is the leasing of projects. The private sector could purchase or lease projects from the government, and it would then be up to the private sector to recover the investment money, raise funds for

operation and maintenance, and make a profit through revenues. It was pointed out that it will be a particular challenge to change peoples' attitudes with afforestation, since so far all such projects have been managed by the government and people expect the government to operate and maintain them. The opportunity for greater private sector involvement, however, also opens the door for mitigation and disaster resilience in such projects—reducing potential losses increases profits and makes it more likely a business will be operating when perhaps competitors are not.

The possibility also exists for a more direct involvement of the private sector in disaster-resilient telecommunications, through the GramTel project. Telephones are an infrastructure with a high level of penetration and high financial returns. A private/public partnership could increase access to facilities based on the PCO concept (telephone booths operated by privates), which is very successful all over the country. Also tele-medicine could be feasible at a minimal cost, since there are new hospitals and clinics being built in rural areas. Apart the initial cost of getting connected and installing the software, tele-medicine would be a value added to existing structures. As to the potential of using GramTel for information dissemination and timely warning, the program could easily integrate and support the work done by the volunteers of the Cyclone Preparedness Program. Telephones are highly reliable during all sorts of crisis.

Continued growth in the MFI sector can also directly relate to infrastructure and the potential of making such infrastructure disaster resilient. The next phase of the ongoing IDA-supported Poverty Alleviation Microcredit Project will provide microenterprise loans to

graduate borrowers to scale up their activities (Islam, 2000). Many of these activities could center on provision of various aspects of infrastructure, including transportation and telecommunications—operation of village communications centers, operation and maintenance of village or neighborhood cellular phones; maintenance of embankment sections and other water management projects.

The attached matrix, *From Strategy to Action*, summarizes some of the activities that could be undertaken to promote further investment in infrastructure in a disaster resilient manner.

From Strategy to Action

The recommendations in this Action Plan summarize the issues discussed above and build on the desk study that was completed in a complementary initiative (see *Focus on the Poor: Long Term Disaster Management in Bangladesh*), as well as an international conference in June 2000 of the same name (see *Proceedings: Focus on the Poor: Long Term Disaster Management in Bangladesh*). Infrastructure development, provision and maintenance are critical to the growth and development of Bangladesh, and one of the objectives of the conference was to emphasize the participation of the private sector and MFIs in this sector. While some of the following recommendations may not seem directly related to infrastructure, they are closely related to the future role of the private sector and MFIs and therefore have implications for infrastructure development and maintenance.

The following table moves from broadly identified strategies to more specific issues, identifying how each can be turned into action that will result in the provision of a more disaster-resilient infrastructure:

STRATEGY	ISSUE	RECOMMENDATION
Analyze disaster risk	<p>A fragile environment leads to physically hazardous conditions</p> <p>Country vulnerable on many different levels to natural disasters, and vulnerability is increasing.</p>	<p>Understand the importance of water resource and coastal zone management, and support the management of these natural resources as integral components of a comprehensive disaster management plan.</p> <p>Understand risks in terms of hazards and vulnerability— disseminate this information widely by creating networks, opportunities for information exchange among private sector, NGOs, government, communities. Recognize regional nature of disaster risk and possibilities for regional management and cooperation (ProVention Consortium could provide support)</p>
Understand the Context	<p>Leading NGOs and GOB are recognizing the importance of developing mitigation and preparedness programs; however, private sector participation in disaster management has not yet developed.</p>	<p>Public-private partnerships in disaster management need to be formally encouraged. Considering the vulnerability of infrastructure to natural disasters, the participation of private sector in infrastructure protection through risk sharing and risk transfer mechanisms could be encouraged through appropriate policy interventions.</p>

STRATEGY	ISSUE	RECOMMENDATION
	<p>Individual and traditional coping mechanisms in place for generations, used in agricultural practice and village life; however, these mechanisms are inadequate during large-scale natural disasters. The role of government in providing immediate relief and that of private sector in assisting the recovery of individual businesses and enterprises are extremely important.</p> <p>Recognize the national context in which private sector operates, that the private sector in Bangladesh can range from small scale business to large corporations. The importance of disaster management may best be understood by the private sector in terms of business recovery and continuity.</p>	<p>Recognize the need for households' access to resources; Share lessons widely from programs assisting poor households in recovering from economic impact of natural hazards; Identify factors which increase the adaptive capacity of households and build their resilience in face of large-scale natural disasters..</p> <p>Involve private sector in development of plans to ensure continuity of business and internal and external trade. Support a range of participation in disaster management from individual small scale entrepreneur managing the village telecommunications center to the national company maintaining toll roads to the MFIs offering microcredit and micro-insurance services. Also, the private sector can play a strong philanthropic role.</p>

STRATEGY	ISSUE	RECOMMENDATION
Develop Capacity	Idea of private sector investment in infrastructure development for disaster management is new in Bangladesh; it needs to be encouraged and formalized	Create a forum for private sector companies to use as a network, share experiences, prepare business continuity plans, work out risk pooling and risk-sharing arrangements, provide training, similar to the Disaster Forum created by the NGOs
	Learn from experience and best practices from other countries and introduce innovations in the provision and maintenance of infrastructure by private sector.	Continue to support regional conferences/workshops that focus on information exchange and knowledge transfer. Apex business and trade forums in conjunction with the Disaster Management Bureau can support these initiatives. (example: June 2000 International Conference in Dhaka)
		Use the media to encourage wider discussion of the role of the private sector in disaster management.. Use the media to make their preparedness plans available to all the important stakeholders.
	It is necessary to develop expertise, provide institutional support and commit resources	Set up a forum for private sector coordination in disaster management; encourage greater insurance coverage to the private sector and public infrastructure through public and private sector insurance companies; and support Microfinance institutions in assuming a larger role in disaster management Support targeted programs through an apex forum, which build the capacity of private sector in disaster management.

1. STRATEGY	ISSUE	RECOMMENDATION
<p>Promote private sector involvement in building disaster resilient infrastructure</p>	<p>Small scale private entrepreneurs can play a larger role in providing and maintaining infrastructure</p>	<p>Certain basic infrastructure in rural and remote areas can be assigned to private sector for maintenance; given the budgetary constraints of the GoB, this is an important element for private sector partnership and participation. In all circumstances, it is necessary to have an infrastructure protection plan.</p> <p>Develop joint training programs (government and private sector) addressing the practice of good construction and maintenance. Enforce the building code with the active support of the private sector.</p> <p>Encourage private sector participation in the construction of cyclone shelters. Encourage investment in setting up and maintenance of communication networks .</p> <p>Entrepreneurs can provide community water and sanitation centers, neighborhood sewage schemes, intermediate transport such as carts and rickshas, shrub and tree planting, energy (and health) efficient stoves, etc. These services reduce individual and community vulnerability to disaster.</p>

STRATEGY	ISSUE	RECOMMENDATION
<p>Promote private sector involvement in building disaster resilient infrastructure</p>	<p>Transportation and environment sectors are likely candidates for private sector involvement, as well as water management, telecommunications and microfinance</p>	<p>Encourage private sector participation in the construction of roads on embankments and provision of riverine transport. Regular use of embankments and river routes will guarantee adequate maintenance of water-related control structures.</p> <p>Invite the participation of the private sector in the maintenance of flood and drainage structures such as water control structures, sluice gates, drainage systems. A new report “Steps towards a new National Water Plan” has recommended the private sector participation in following terms:</p> <p>“Private sector involvement in providing water services can be encouraged through different steps. A typical arrangement is private leasing or concession, with a facility such as a water body given in long-term lease through competitive bidding to a private operator. The lessee invests in improving the facility and operating and maintaining it. Such arrangements are found in Côte d'Ivoire, Guinea, Macao, Portugal, Spain, and Argentina (World Bank 1993a). Many countries in Latin America are adopting similar approaches. Bangladesh's success with private sector participation in the sale, operations, and maintenance of tubewells is particularly encouraging for expansion to other commercial water activities. Other forms of privatization include transfer of facilities to beneficiaries like water user associations.</p> <p>There are a number of private firms in Bangladesh capable of providing various services to the water sector such as design, construction, and operations and maintenance. In light of the government's willingness to encourage the private sector to take over functions from state agencies, it would behoove the sector to have well-conceived policies in place for private operation. Major public organizations have awarded operational contracts to private companies for agricultural services in the past, and the same thing could happen in the push to decentralize water services”</p>

STRATEGY	ISSUE	RECOMMENDATION
<p>Provide opportunities for Microfinance Institutions to invest in infrastructure, and promote disaster resilience</p>	<p>There are many possibilities for introducing risk transfer features in the investment strategy of the private sector for infrastructure development</p> <p>Microfinance institutions in Bangladesh are one of the most important sources of private finance; and they can be tapped for supporting basic infrastructure services in the country</p>	<p>Seek the participation of the private sector in afforestation in coastal areas; encourage mitigation banking with the participation of private sector to restore wetlands.</p> <p>These risk transfer features could be introduced through guarantees, and insurance schemes. Catastrophic bonds and weather-based index can be used for protecting infrastructure.</p> <p>Credit could be provided, for example:</p> <ul style="list-style-type: none"> To groups of farmers to strengthen embankments To communities to construct small shelters To small entrepreneurs who provide communications facilities through public call offices, and provide other essential provisions through their own outlets. To artisans and small entrepreneurs for business recovery and continuity

STRATEGY	ISSUE	RECOMMENDATION
	<p>Provide a range of financial services which strengthen the coping capacity and resilience. For example,</p> <p>Promote savings and diversification of asset base</p> <p>Promote mitigation by establishing a social fund to support community-based activities</p>	<p>In future, there will be more emphasis on MFIs' role in supporting microenterprises (through Microcredit II project of World Bank)—some of these small businesses could be encouraged/trained to provide infrastructure services which reduce communities' vulnerability</p> <p>Provide credit and training for self-employment opportunities to communities—as economic condition improves, vulnerability can be reduced. Vulnerability reduction has a very positive impact on habitat and infrastructure.</p> <p>Social funds can be used for constructing and maintaining community infrastructure—such as flood and cyclone protection shelters, and cattle shelters, community water and sewage schemes, roads and means of transport, clean stoves, tree planting, etc</p> <p>Mitigation funds can be channeled through the MFIs to provide direct support to the hard-core poor and protect their assets. Provision for cheaper loans to households and microenterprises. These measures will help in the maintenance of infrastructure indirectly. The latest World Development Report clearly establishes the importance of infrastructure for poverty alleviation.</p>

STRATEGY	ISSUE	RECOMMENDATION
<p>Provide opportunities for MFIs to invest in infrastructure and promote disaster resilience</p>	<p>Strengthen central disaster management fund so that MFIs can remain financially viable in event of disaster, and continue to provide loans to beneficiaries, including microenterprises providing infrastructure services</p>	<p>To provide a reliable re-financing facility which can be used to maintain the liquidity of microfinance institutions. Strong and dependable financial institutions create and maintain conditions for business and economic recovery.</p>
	<p>Promote mitigation through housing funds</p>	<p>Housing activities aimed at mitigation of specific hazards can assist the housing sector, and also improve infrastructure services indirectly.</p> <p>Promotes employment and income-generation.</p> <p>Structure fund so MFIs offer incentives to borrowers to utilize credit for house improvements for example, if so many people borrow money to improve housing, MFI (in coordination with municipal development fund) contributes road or embankment</p> <p>Building resource centers can be set up through a partnership of government, private sector and communities. These resource centers can help in housing activities at the community level. They also promote capacity-building and provide a good opportunity for a community to become more involved with other community-based construction activities including infrastructure.</p>

STRATEGY	ISSUE	RECOMMENDATION
<p>Help MFIs develop financial products that encourage asset protection and mitigation</p>	<p>Investigate new products</p> <p>Provide Savings and credit-based insurance through MFIs; encourage private sector participation in insurance protection for critical infrastructure; introduce re-insurance through international financial markets and increase the risk pool</p>	<p>Set up a national insurance fund through an apex financial institution. This fund can support insurance for critical infrastructure. It can also support:</p> <ul style="list-style-type: none"> --savings-based insurance under which beneficiaries would save, and part of savings be taken as premium for insurance. -- appropriate insurance policies for small commercial entrepreneurs and artisans to guard them against business interruption (grocer, carpenter, handicrafts worker, rickshaw puller, etc.) <p>Investigate adapting insurance program being run by Self-Employed Womens' Association (SEWA), a women's NGO in India, for providing health, life and asset insurance to the informal sector (Integrated Social Security Program) in Bangladesh</p> <p>Consider adapting the idea of developing health centers (offer both insurance and health services) to other NGOs/MFIs and communities in Bangladesh</p>

Emphasize multiple uses and functions in infrastructure planning and development

Because Bangladesh is such a fragile and vulnerable environment with limited resources, it is important to develop infrastructure which is functional in more ways than one

GoB and private sector, along with local governments, communities and NGOs, develop cyclone and flood shelters that have multiple uses—as schools, community centers, health clinics, communication centers owned and maintained by communities / private sector

Develop embankments into multi-purpose infrastructure; they provide flood protection and can be used as roads as well.