1.3 FCDI Chronology

1.3.1 Water Sector in Bangladesh

Bangladesh, a land of about 144,000 sqkm, is one of the largest delta of the world, formed by the most complex river system of the Ganges, the Brahmaputra and the Meghna, and situated in the tropical zone. The country is crisscrossed by as many as 458 small and big rivers with innumerable khals (small channels), beels (small depressions) and haors (large depressions on the North-Eastern part). Many of these water bodies are perennial, but mostly are seasonal except the majar and big rivers.

Climatically, the country has two distinct seasons: the dry season from October to May and the wet season from June to September dominated by the monsoon. The normal annual rainfall varies from 1,200-3,450 mm during the monsoon. Over 80% of the rainfall occurs from May to September. Temperature varies from 21- 34 ^{o} C during April to September and 9 - 29 ^{o} C during November to February.

Floods due to rise of water levels in major rivers and heavy rainfall between May and September are an annual feature. The normal floods, popularly called *barsha* occur with such remarkable regularity in timing, duration and magnitude that they have determined the way of life for the people over centuries. The social life, economic activities and culture of the people have been regulated by and are dependent on water. The agricultural practices and cropping pattern have been adjusted to the normal conditions of rainfall and flood inundation.

Many occupational groups such as the boatman, earn their livelihood from the normal flooding. It facilitates bio-diversity and maintains environmental balance and to a great extent supports poor people to have access to common property resources. Harmful floods of abnormal depth, timing and duration, which are termed as *bonnya*, occur occasionally - say once in a decade on the average. These floods cause damage to agricultural crops, loss of lives and properties, and immeasurable miseries to people, particularly the poor.

Like the flood, drought due to lack of the adequate rainfall during the dry season, is another annual feature. Few showers during February to May keep the effect of drought on crops to a minimum. If the winter showers are too scanty or is late drought causes devastation to crops.

Agriculture is the mainstay of Bangladesh's economy. This sector generates about 60% of the total employment of the country and shares 36% of the GDP. All other sectors depend on it. Normal agricultural practices and crop production suffer heavily due to floods and droughts. Between May and October, one-third of total cultivated land is deeply flooded (over 1 meter of flooding), and another third is shallow flooded (less than 1 meter). Coastal areas are subject to storm surges. Between November-April, there is little rainfall, and some 60% of cultivable land area remains fallow.

The national goal of achieving self-sufficiency in food also depended very much on the increase in per acre yield, which is one of the lowest in the world. Per hectare yield of rice in Bangladesh is 2,350kg while for Japan, Egypt and North Korea those are 6,322kg, 5,947kg and 5,821kg respectively. Any effort to increase per acre yield made it imperative to introduce improved water management for adoption of improved technology, but that had been lacking. Consequently, food production lagged behind the faster rate of population growth.

So in order to meet the food requirement for a faster growing population and for overall national development, water sector became key important and the Government attached high priority to irrigation and took up water management projects.

1.3.2 FCDI Project and Water Management

Embankments have been constructed and subsequently managed in Bangladesh for a long time. When the British arrived in Bengal in 1757, they found a widespread system of embankments covering the land. These were built under the Moguls, who imposed a stiff land tax to finance them. The British abolished this tax and the embankments fell into disrepair. Since then, however, widespread incidences of local initiatives with regard to the construction of embankments started and can still be found.

Bangladesh (erstwhile East Pakistan) became independent of the British colonial rule in August 1947. During the British rule there were not much of FCDI activities in this part of the then India. During the Pakistan times only a few small-scale irrigation works were taken up on localized basis albeit the Ganges-Kobadak Project, which was a large irrigation project and was envisaged to provide irrigation facilities to 120,000 ha of cultivable land.

In 1954 and 1955 Bangladesh had two successive floods that inundated about 27% and 37% of the country respectively (See Figure A2.6-1) and caused immense loss to crop, property, life and untold miseries to people. This drew the attention of the then Government of Pakistan and a flood control organization was set in late 1955 to look into the flood problem and suggest remedial measures. This flood control organization was created under a separate Chief Engineer in the Irrigation Department of the then Provincial Government.

A number of international missions visited the country to study the flood problem. In 1956, a UN Technical Assistance Mission (Krug Mission) studied the general flood problems affecting the country. This Mission pointed out the need for major hydrological investigations, and recommended setting up of a Water and Power Development Authority for taking up implementation of specific water and power development projects.

The main recommendation of Krug Mission include (i) feasibility study of flood control dykes on the banks of major river including and/or flushing sluices and drainage regulators, and, if found feasible, implementation of these on priority basis; (ii) to take up and implement smaller flood control, drainage and irrigation projects; (iii) to take up a feasibility study of construction of a

barrage on the Teesta for irrigation and flood control; (iv) to raise the level of homesteads in the flood control areas to rehabilitate them on flood dykes; (v) to identify areas where flood control can not be effectively done and industries, vital installation, etc., should not be constructed in such areas; (vi) co-operation should be established with India and other countries for development of comprehensive flood forecasting in the common rivers.

Thirty years before the Krug mission Professor Mahalano analyzed available records on flooding patterns and indicated probable long trends in flooding, and the possible effectiveness of flood protection measures. The central theme of his findings was that "it is therefore necessary to advise and educate the inhabitants to adopt their life to the changing conditions; to build their houses on raised grounds, and to take other precautionary measures (like flood warnings)"(Mahalanobis, 1927:6-7 cited in Adnan et al, 1992).

Following the recommendations of Krug Mission, the then East Pakistan Water and Power Development Authority (EPWAPDA) was established in 1959 as an autonomous organization, abolishing the Irrigation Department of the Provincial Government, with the mandate of planning, implementation and operation & maintenance of flood control projects. A separate wing named the Flood Control Wing was specially created under the EPWAPDA. The need for flood control got public as well as institutional recognition and ranked high on the agenda of the Government of Pakistan.

Immediately after its set up, EPWAPDA commissioned an American consulting company IECO (International Engineering Company INC, San Francisco, California) as its general consultant and they continued to base themselves on the recommendation made by the Krug Mission, which was very much a voice of 'Modernization'. "The destructive floods of recent years call for control measures to protect the growing population,... Forty five million people who live today under the imminent threat of disease and starvation, would advance to a new and vastly better way of life ... Gone would be the ever-present fears of flood on the one hand, and famine on the other. Secure in their lives and property, the people would be able to plan, to build and to make progress.

In 1963, General Hardin, a former Chairman of the Mississipi River Commission in USA, and, in 1964 Professor Thijsse of the Netherlands visited the then East Pakistan (Bangladesh) and laid down the broad basis for flood control plan, which was followed by the IECO. Thus the issue of Flood Control and Drainage (FCD) acquired prominence both nationally and internationally. It was recognized that Management of surface water will continue to dominate the livelihoods of most people in the country, more directly for some than others. Water control is of key importance and instrumental for rural development of Bangladesh. Water management infrastructure, both public and private, will play an important role in attaining food security.

In 1964, IECO formulated a Master Plan for the flood control and drainage with the finance of USAID. The basic premise of the Master Plan was that full flood control was the key to increase agricultural production, i.e. the exclusion of floodwater from farmlands by embankments and the removal of excess rainwater accumulations within the protected areas by sluicing or pumping

(IECO - Master Plan, EPWAPDA, 1964) and alleviating poverty. IECO Master Plan included the construction of about 58 FCD/I projects consisting of thousands of kilometers of embankments, nearly hundred polders, and innumerable sluices and other water control structures, covering large parts of the country for implementation in next twenty years. Water management still was not an issue.

Construction of many of the Master Plan projects started immediately. Simultaneously a number of polder projects were taken up for construction in the coastal region of Bangladesh under the Coastal Embankment Project (CEP). In mid-1960s FCD activities got a boost up and large-scale investment was made for FCD projects.

In 19751 the Netherlands Government initiated the "Early Implementation Projects (EIP)" within the BWDB for implementation of small scale flood control, drainage and also (initially) irrigation projects, which later has been followed by some other donors like the Asian Development Bank (ADB) and the International Fund for Agricultural Development (IFAD).

Thus the then Pakistan Government and later the Bangladesh Government, supported by the international and bilateral donor agencies, embarked on Flood Control and Drainage Projects in a massive way. By now, Bangladesh Water Development Board (BWDB) has 461 completed projects in its portfolio.

The issue of Water Management took sometime before it came to limelight and was accepted as an agenda. In the second half of 1960s, following the construction of embankments under the Master Plan projects, particularly the Coastal Embankment Project, people started demanding irrigation water. As there was no such provision in the FCD projects, local people cut embankments in different places to take in water for irrigation. The then EPWAPDA officials looked at embankment cutting as a criminal offence and tried to stop it. Even there were incidents of shooting by police to stop local people from cutting embankments.

Gradually local people started resistance against construction of FCD projects without making provision for irrigation. This became a phenomenon. Water management emerged as an issue to be reckoned with and the Government started to conceptualize water management projects, initially, for the Coastal Embankment Polders in the Southern part of the country. In 1970, World Bank envisaged a project for water management in the Coastal Embankment Project. Thus the irrigation component made its entry into the FCD Projects. In 1972 the World Bank's Land and Water Sector Study also highlighted the water management issue. A Project Concept Paper (PCP) was prepared for the purpose in 1973.

It was not until the Delta Development Project (DDP), 1981 - 1987, a Project under the Netherlands Technical Assistance Program, that the issue of water management was introduced as a component in a FCD project. The issue of people's (beneficiaries') participation took its first root, although in a rudimentary form, in the Early Implementation Projects; but in Delta Development Project and another Dutch-aided project named the Land Reclamation Project (LRP), the issue of

peoples' (beneficiaries') participation was pronounced and institutionalised.

In early 1990s, water management at farm level became the focal issue in the System Rehabilitation Project (SRP) World Bank-European Union-Netherlands Government –Government of Bangladesh joint effort. Lot of detailed and in-depth studies has been conducted and documentations have been made in this area under the SRP.

Till recently, the expression "water management" used to refer to water management at farm level or at the project level. Over the last few years, this expression is being used with much wider scope and to denote water management at regional and at national levels also, which envisage the management (allocation) of total water resources available at the corresponding level, among regions and projects.

1.3.3 Performance of FCDI Project

Due to its importance for generating agricultural growth, the water sector quite legitimately has attracted a substantial allocation of national and external resources. About 13.5% of the total annual development budget of the Government is allocated for this sector. Most of these resources flow from foreign aid - in the form of credit and grant for construction works, purchase of equipment and training etc, which shares 58.8% of the development budget of BWDB for 1998-99. For efficient and effective utilization of the project aid, technical assistance is also provided from the foreign aid fund. Local resources are used to meet mainly the expenditures for establishment.

Since its inception in 1959, BWDB has constructed about 6519 km of dykes, including 3674 km of sea dykes, 6095 small and big sluices, 1276 big regulators, 6419 km of drainage and irrigation canals, 1044 closures, 3584 bridges, 87 pump houses, two cross-dams to reclaim about 129,000 ha of new land, 1 barrage envisaged to protect about 2,844 million ha of land from upland and tidal flood hazards and bring 192,000 ha under irrigation.

The performance of FCDI systems has often remained below expectations. More than 50% of the 461 completed projects are not performing - some due to inadequate planning, but mostly due to lack of proper operation and maintenance. Moreover, they have several major negative impacts, such as the loss of fisheries, navigation and soil fertility and the exacerbation of drainage problems.

Failure to perform or to meet the objectives by more than 50% of the FCDI projects has become serious concern for everybody. International development agencies as well as the Government of Bangladesh have expressed increasing dissatisfaction with the agencies responsible for their management about the performance of Water Management Projects. Cursory overviews of the past years reveal the following:

- Government (BWDB or EPWAPDA) build FCDI projects which remodel the prevailing system according to its own planning and design criteria and procedures;
- Beneficiaries regard those as government projects whose operation and maintenance

responsibility lies with the government and they don't feel any responsibility to contribute to improve operation and maintenance;

- Operation and maintenance fully depends on government's efforts and at considerable costs;
- Government has limited capacity to handle all the problems related to operation and maintenance.

Many evaluations have concluded that the project benefits are not materializing as a result institutional weaknesses. Increasing people's participation in all stages of water resources development is widely believed to be one of the key requirements for tackling these institutional weaknesses. Efforts are now under process to introduce and ensure peoples' participation at all stage of a project, particularly in operation and maintenance, although the success stories are very insignificant.

A "Guidelines for People's Participation in Water Development Projects" (GPP) has been approved by the Ministry of Water Resources (MoWR) in June 1995. That did not work well and has been confronted with lot of inconsistencies, inadequacies and problems for its usability. The guidelines have been reviewed and proposed for revision based on the experiences from its implementation. In December 1996, the Bangladesh Water Development Board (BWDB) started the revision process.

In the backdrop of the above scenario, the study subjects would cover:

1. Water management In FCDI system;
2. Operation and maintenance of FCDI projects;
3. Role of stakeholders (people);
4. Efforts to ensure stakeholders' participation;
5. Analyze the earlier experiences and formulate recommendations to introduce and ensure stakeholders' participation in FCDI Projects with particular attention to operation and maintenance activities.