

Squatter Settlement on the Flood Protection Embankment in Dhaka City

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Executive Summary

Dhaka, a city of 7 million people, has been declared as mega city. The rapid growth of the city has resulted in the development of several squatter and slum settlements. Most portion of the flood protection embankment is also occupied by these squatter settlements. This type of settlement is very harmful to the existence and purpose of the embankment. In this study the existing situation and factors influenced the formation of the settlement would be dwelt on.

Introduction

In Dhaka, squatter problem is being felt for several years. After liberation in 1971, the situation is fast deteriorating owing to the rapid influx of rural migrants to the metropolitan areas and large cities. Dhaka being the capital city experienced a critical condition in respect of squatter settlement. About 40 percent of the population in the city live below the poverty level and 25 per cent are found to be squatter (Hossain, 1999). Now squatter problem has become a continuous phenomenon because of deteriorating rural economy.

Squatter settlements are mostly found in pockets of land in the inner urban areas adjacent to employment sources. Squatter settlements are likely to form in the middle zones or outskirts of the city. The squatter occupy all available vacant public lands and abandoned and unused private land usually on marginal terrain besides railway tracts, slopes or depressed land, sewerage lines and on river banks. -Fjg~.2 shows the slum and squatter settlement locations in Dhaka City in 1 998

The present rate of population growth of the city is about 6.5 percent per annum which is much higher than the national rate. According to the latest Census of Bangladesh in 1991, the population of Dhaka Statistical Metropolitan Area (DSMA) was 6.1 million that spreads over an area of 1353 square kilometers. The Dhaka Metropolitan Area (the area under the jurisdiction of RAJUK, the planning authority of the city) is larger than DSMA, and in 1991 it had a population of 7.3 million spread over an area of 1530 square kilometers. By 1987, the United Nations Department of International Economic and Social Affairs identified Dhaka as one of the world's mega cities. (Hasan, 1999).

The rapid growth of the city has resulted in the development of several squatter and slum settlements, and a large number of poor shacks. Dhaka is now a poverty-ridden city. About 30% of Dhaka's population can be defined as hard core poor (defined as having per capita monthly income of US\$ 43 or less), and 50% as poor (per capita monthly income of US\$ 65 or less). Altogether close to three million or nearly one third of Dhaka's population live in 2100 slums and squatter settlements in the city; and many of them work in the informal sectors and the emerging export-oriented industries. There is massive inequality in access to land, and land price is increasing very

rapidly. Because of scarcity, speculation and increasing demand, the price of land in the city is increasing at phenomenal pace: about 20 to 50 times in the last 15 years (Hasan, 1999).

Rivers surround Dhaka on all four sides- Tongi khal on the north, Balu River on the east, Turag River on the west and Buriganga River on the south. In anticipation of the gravity of flood damages, flood control embankment is constructed to secure an environment safe to lives and properties, and to reduce the damages and losses to acceptable tolerant limits. The width of the embankment at the ground level was about 66.5 meters and average height from the ground level to the crest was about 3 meters (Fig.01).

A large group of people in Dhaka City has no access to the land and housing. But the embankment offers them a rent-free, flood free opportunity of living close to place of work. For this reason, a large number of people have settled themselves on the embankment. The settlement has detrimental effects on the embankment. Construction cuts into the embankment profile and removal of vegetation cover together with associated development of footpaths bring about erosion (Khan, 1993). Now, it is because of social and political reasons that it is very difficult to remove these dwellings built on the embankment. Thus the prevailing situation offers an attractive field of study and research. Therefore the paper is supposed to identify the inherent factors responsible for the formation of embankment settlement as well as the typology of the settlement and housing.

A brief history of Dhaka:

Dhaka, the capital city of Bangladesh, is located in one of the largest delta systems of the earth formed by the Brahmaputra, Jamuna and the Ganges. The delta makes the region one of the most fertile lands on earth. The Ganges, the Jamuna and Brahmaputra with their tributaries provided an excellent cross-country communication even in the days when roads were few and railways were unheard of. The rivers were divided into branches and tributaries that people would easily travel along by water transports. Situated in the center of the delta Dhaka had a command over all the water routes. It was also comparatively well placed for inland communications. The geographical location of Dhaka with its network of inland waterways made it an important location both strategically and commercially.

The growth and development of Dhaka can be categorized into five periods, e.g. the pre-Mughal period (1205-1610), the Mughal period (1610-1757), the British colonial period (1757-1947), the Pakistan period (1947-1971) and the Bangladesh period (started from 1971). In the pre-Mughal period people of Dhaka lived in Mahallas and the inhabitants of these Mahallas specialized in specific trade or craft. Water transport was the principal means of communication for the people because there were very few roads. During Mughal period Dhaka flourished so much that its population rose to 900,000 at the end of the Mughal Period. The Mughals introduced road networks and changed some of the physical structures of the city. Dhaka developed as distinctive parts of closed localities of residential quarters and bazars with pleasure gardens and magnificent villas of the nobility.

The defeat of the local ruler of Bengal by the East India Company in the battle of Palassy in 1757, paved the way for British rule in the Eastern part of India, and subsequently started the decline of Dhaka in trade and industry (Dani, 1962; Karim, 1965). Its status was further reduced when the East India Company assumed the responsibility of Dewani (Authority for administration and trade) in 1765 and appointed a Council of Revenue and subsequently a collector for Dhaka. Warren Hastings's policy of centralization at Calcutta further reduced the importance of Dhaka, and it gradually diminished in importance, and assumed the position of a district headquarters in 1882 (Mohsin, 1991). By 1880 this decline had reached its nadir, and most of the former city had either been deserted or fallen victim to the encroaching jungle (Herber, 1849; Ahmed, 1986). Dhaka's population fell from 900,000 in 1765 to 150,000 in 1824. It further diminished to 20,000 by 1937 (Amain, 1991; Cadman and Payne, 1990)

A breakthrough in the fortunes of Dhaka came in 1905, when Dhaka was made the capital of the newly formed province of Eastern Bengal and Assam (through the partition of the province of Bengal). In 1905, Lord Curzon founded Dhaka as the capital of the newly formed province. But this euphoria was short lived (Akhtar, 1991). The impetus of growth which was bolstered by the creation of Dhaka as a new capital, was seriously jolted by the annulment of the partition of Bengal in 1911, when Dhaka reverted back to the status of the district town (Chowdhury and Faruqi, 1991)

With the end of the British colonial rule Dhaka became the provincial capital of East Pakistan. There was an exodus of people from India into this region while a large section left Dhaka. The Dhaka Improvement Trust (DIT) was established in 1952 to control private development and prepare schemes for planned development of housing, roads, commercial centers, etc. A Master Plan was prepared in 1959 covering an approximate area of 830 sq. km (320 sq. miles) and for a population of 1.5 million. The plan provided proposal for planning, land use, housing and infrastructure. Since its inception the effort of the DIT was geared to provide highly serviced plots to high-income people. On the eve of independence national population had increased to 75 million and the population of Dhaka was 1.2 million.

The last phase, Bangladesh period, marked a major change in the political scene with the emergence of Bangladesh as a sovereign state and Dhaka as the capital city of Bangladesh. Major social, economic, administrative facilities and activities are concentrated in Dhaka. As a result people started to migrate to Dhaka. The annual growth during 1961-1974, 1974-1981 and 1981-1991 periods was 9.3%, 9.4% and 7.8% respectively. The population of Dhaka at present is estimated to be 10 million spread over an area of 1629 sq. km. Expatriate Bangladeshi foreign remittance was spent on purchase of urban land particularly in Dhaka. One important phenomenon was the implementation of the flood protection embankment for Dhaka. Owing to lack of any comparable investment in terms of security and return, people bought land. This also blocked development in land.

Objectives

The focus of the study were on the present situation of the squatter settlement, the factors influencing the formation of the settlements as well as the rehabilitation prospects etc.

Research methods

The research is mainly based on primary data collection method. Moreover, some secondary sources like books, journals, reports and publications have also been used as supporting data bases. The different stages and methods of collecting primary data are described below. It may be relevant here to say that in addition to the formal process of collecting data, the researcher spent a considerable time observing the community in an informal manner by visiting the study area frequently and interacting with its residents as a participant observer

STUDY AREA

This study is conducted primarily on process and pattern of the human settlement on the Greater Dhaka Flood Control Embankment. These are mostly developed on the earthen embankment starting from Tongi Railway Bridge up to Kellar Morh(fort junction). Four typical areas were selected for field survey along the whole length of the earth embankment starting from Kallaynpur pump house up to Kellar Morh at old Dhaka. The basis for selection of this portion as study area is mainly population density and level of development as embankment settlements.

24.0m 4.0m 7.0m 18.0m 13.5m

Fig 01: Typical section (including 4 lane highway) of the embankment from Kellar Morh to Kallayanpur canal.

Fig 02: LOCATION OF SQUATTER AND SLUM SETTLEMENTS IN DHAKA CITY

Physical characteristics: The flood control embankment in the area are essentially longitudinal dams erected roughly parallel to the Buriganga river. The average width of the embankment at the ground level is 66.5 m. and the average height from the ground level to the crest is 8.8 m. The width at the crest is also 4m. The settlers build their homesteads on the embankment area which are reserved for the construction of 4 lane highway.

Settlement Pattern: Linear type of settlement has been developed along the embankment. This settlement could not be developed haphazardly or dispersely like other squatter or slum settlements. Settlements have been grown either in the inner side or in the outer side and mostly in both the sides of the embankment.

Settlement and housing typology: A linear type of settlement has been developed on both the sides of the embankment from Satmasjid Road to Kallaynpur area. In the other area settlement has been developed mostly in one side in the inner part of the embankment. Most of the settlements show densely and scattered situation.

The houses at the outer portion of the embankment are built on the stilts as high as normal flood level. Some temporary type of houses are built on the flood plain which would be shifted in the rainy season on the top of the embankment. The houses in the outer part are built on the concrete slabs. In between the slabs they have used bamboo poles with iron rod at the end for the erection of their houses.

Some houses are built on stilts using bamboo pillars on private land using the embankment as access road. Similar houses are also constructed on the marginal public land beside the embankment using it as the access road. This situation reflects the over crowding situation on the embankment.

Most of the houses are kutcha (earthen) in nature. There are also some semi-pucca structures. Poor construction materials are used for the houses in the settlement. Polythene sheet, split bamboo, straw, *goalpatha* (a kind of leaf) etc. are used as the common building materials for most of the houses in this area.

Access facility: The embankment has a good linkage to the existing road network of the adjacent developed area. Access road developed to link with the existing road in different places of the embankment. But in the rainy season most of the roads go under water. People use traditional boat in this season.

Walkway: The embankment crest of 4 m. width is used as walkway or the main road. Most of the walk ways are unmetalled. The walk way passing between the two rows of the houses in the area from Smritishawdhaw to Sikder Medical is three feet metalled road. This metalled road was constructed in 1997. During rainy season the condition of the unmetalled road becomes unusable. Slabs used for the protection of erosion in the outside of the embankment are hence used as the walk way in some areas.

Sanitation: Most of the latrines are kutcha (earthen) in nature. A large number of people use open space for this purpose. Some NGO provided community latrine made of brick wall with corrugated iron sheet roof, but they are in poor maintenance condition.

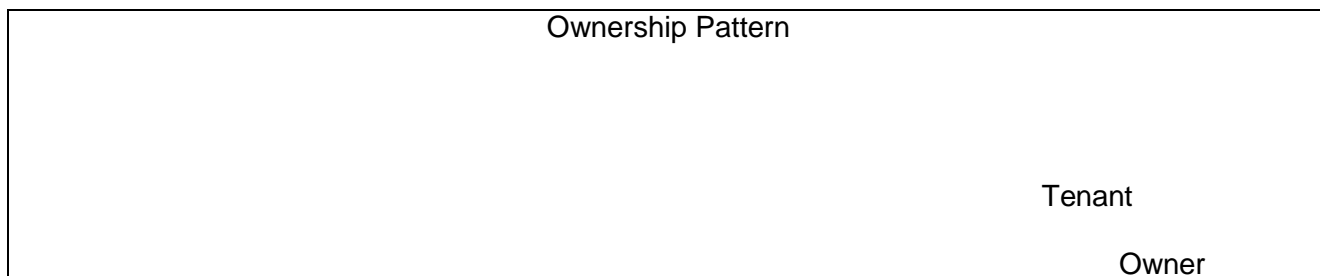
Primary school: There developed NGO assisted primary schools and privately developed Ifteedayee madrashas (primary religious education centre) with inadequate facilities in different places of the embankment.

Daily market: Different types of shop and kutcha bazar were developed on the embankment. These shops are very near to the houses.

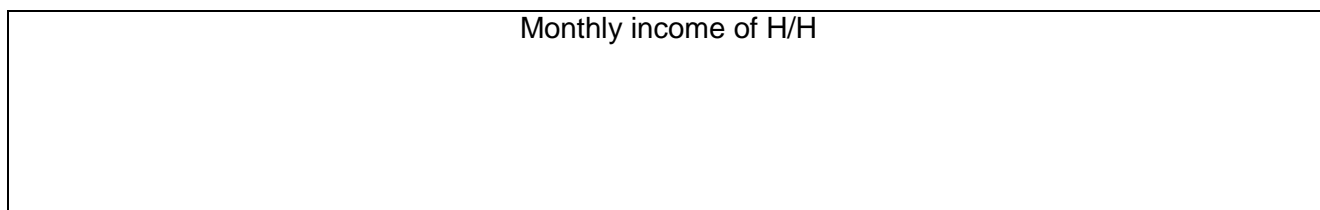
Water supply: Shallow tube-wells were installed on concrete floor. This is the main source of drinking water. Water supply system is not provided.

Electricity & gas: Electric poles are installed on the embankment which are not accessible for the settlers of the embankment. Gas line has not been provided.

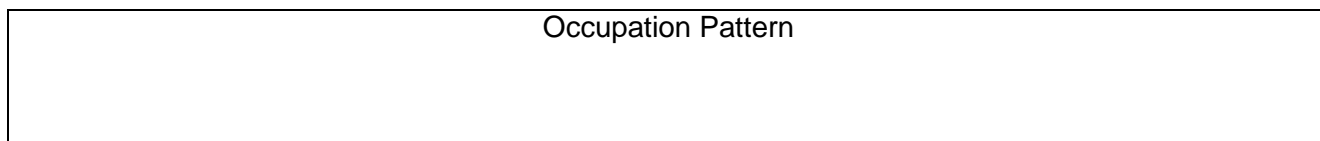
Ownership pattern: 71.7 percent of the household surveyed have their own houses and 28.3 percent have not.



Income pattern: 52.7 percent of the households earn from tk.2001 to 3000 and 77 percent of the households earn below tk.3001. Moreover, 99 percent household earn less than tk.6001, Whereas, only .5 percent of the households earn above tk.7000. Here total income of all the employee of the household has been considered.



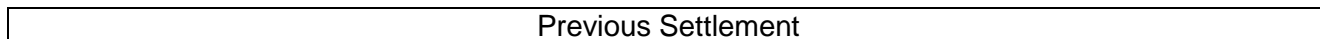
Occupation Pattern: About 37 percent of the households surveyed in the area are engaged in rickshaw or van pulling, followed by about 25 percent engaged in day labour. The next largest portion (20%) of occupation is the petty business. In those four areas rickshaw pulling is the main occupation of the settlers. The day laborers are mainly engaged in brick works in the embankment area and the petty business involves mainly the business of waste materials in the industrial sector in the nearby area.



Some of the inmates work mainly to support the brick business. Mostly all of the members including females and children are engaged to break the bricks into chips. Well-to-do persons in the adjacent area operate the business. The members of the households work all day long but earn a little.

Duration of settlement formation: 39 percent of settlers settled themselves 9 to 11 years before. It shows that after completion of the embankment this group of people settled themselves on it. After the first stage of formation there is a continuous and similar rate of formation.

Previous settlement: 49 percent of the households came from outside of Dhaka. The rest 51 percent came from Greater Dhaka that includes about 32.3 percent from adjacent area and 18.7 percent from distant places of Dhaka.



Mode of transport: 66.5 percent households travel to the existing roads from the embankment on foot and the rest 33.5 percent households use boats as the means of communication with the existing road network.

About 95 percent of the settlers go to the job place on foot and the rest 5 percent use public bus.

Job location: About 61 percent of the employees' working places are within half a mile distance, almost walking distance. Only 9 percent employees go to work at a distance more than a mile.

Mode to working place

Travel cost to the working place: About 93 percent of the households do not have any travel cost to go to their work place.

Monthly travel cost

Factors of settlement formation

Pull factors of the settlement: 26.9 percent households live there because of cheap rent, followed by about 21 percent because of free land. About 14 percent households replied that the reason behind living here is the availability of flood free land.

Pull factors

Push factors of the previous settlement: About 25 percent households left the previous settlement because of less job facilities followed by about 22 percent because of low status of services and facilities. Moreover, about 20 percent households left those places because they had no land there.

Push factors

Attitude towards resettlement: According to table 6.32, 61 percent of the dwellers show interest in resettlement program in other places of Dhaka with proximity to the job location. The rest 39 percent of the settlers show negative attitude.

Interest to resettle

Attitude towards resettlement to own village: 60 percent of the dwellers show interest about resettlement in own villages with relocation benefits. The rest 40 percent show negative attitude towards returning to the village.

Interested to return to the village

Low-income Housing Programs in Dhaka:

RAJUK rehabilitated the people of some areas to Posta, Gandaria and Badda providing them lands at subsidized rate.

In 1977 the Municipal Corporation took initiative for conversion of 10,000 sanitary latrines in the low-income areas but only 1000 were completed. The Municipal Corporation has constructed several multi-storied buildings for sweepers in Peelkhana, Aga Sadeque Road and Naya Bazar areas. Including these, several tin-shed colonies for sweepers have been constructed in Aga Sadak Road, Nayabazar, Gonaktuli, Sutrapur, Wari, Balda Garden and Mohammedpur areas. The Municipality had undertaken to construct a six storied building for sweepers in Wari at the cost of one million Taka for 60 families, which has been completed.

UDD has provided some land and built some nucleus or core type housing for the poor in the fringe areas.

In 1975 a bulk of squatter families were shifted from the central area of the city to Bhashantek. About 2,00,000 squatters were evicted by the police from different parts of the city during that period. Some of them were forced to resettle at Bhashantek where they faced starvation and tremendous problems. However, the Government has taken initiative to resettle again a total of 2300 families from Basantek camp to Bawania, Mirpur Housing Estate, in Dhaka. Each family got a piece of land with a core house built on it and other physical and infrastructural facilities. All other necessary services and community facilities like market, shops, schools, mosques are provided there. The Government also intends to help the families providing employment opportunity by taking up income generating community development projects. The project is partially completed and the government received Tk.1,16,12,500 for the project.

The Government has undertaken a scheme of building some low-income houses for the low income group. Dattapara, Tongi is a initial part of the scheme which aims to improve the living condition of 3444 poor families, who were temporarily settled in early 1975. This is a highly subsidized project and not suitable for large scale replication.

Another scheme aimed for the rehabilitation of 10,000 families from Demara and Tongi Squatters rehabilitation camps, and from other parts of the city, to Jatrabari Housing Estate, Dhaka. Because the shortage of sufficient fund, the project could not be started.

A Sites and Services Schemes of Uttara East(1980) was planned by the Government. The scheme would develop 3450 serviced plots to be distributed within 1985-86. The size of each plot was 65m² (702 sft.) with the facilities of water supply, sanitation, and necessary services and infrastructure such as road network markets health facilities, recreation facilities, schools etc.

Another site and service scheme started in 1986 to develop 6865 plots at Mirpur through the Mirpur Rehabilitation Project. The sizes of the plots varied from 40 m² to 75m². The lowest 20% of the income group was not included within the target people.

A research project over an area of 87 acres of land at Mirpur aided by UNCDF would provide permanent houses to 2600 households. A small core house is to be provided to each family on a lease of 99 years.

The government agency having assistance from international agencies as CARE and others developed a camp like settlement constructing small bamboo huts in closely spaced uniform rows on the periphery of the city. The low-income families of different squatters of the city were taken to the camps. Though the huts were allotted free of cost, most of the households didn't continue to stay there due to lack of accessibility to market places, absence of ownership rights for the allottees, lack of essential community facilities and infrastructure.

UNDP have been assisting and providing aid for two projects which include 3 schemes (a) slum upgrading at Islampur, Shaheednagar and Rasulpur, (b) Rehabilitation in Dholaikhal area and (c) an integrated scheme at Mirpur. Over 470,000 households will benefit when the project areas are upgraded by expansion of infrastructure7 sites and service for 12,600 low income households and construction of shelter on a large scale through self-help program. A squatter resettlement program aimed to provide 12,000 plots to the households in Dattapara, Tongi and Demara in Dhaka.

A critical analysis of squatter resettlement programme in Dhaka city

In January 1975, the Government of Bangladesh launched a slum clearance operation in the capital city of Dhaka whereby about 2,00,000 squatter dwellers of the city were forced either to return to their native village or to settle in one of the three camps: Mirpur, Demra and Tongi (Dattapara). The distances of which are within 5.10 and 15 miles respectively from the heart of the city of Dhaka.

In these three camps about 12,063 plots, on average 14'0" * 25'0" each had been allocated to the destitute. Grid pattern layout and modular units for shelter were used in the camp planning and designing. The shelters were repeated throughout the layout with twin and single units. The materials used in the camp housing were bamboo and straw for walls, and bamboo and polithyne for covering roofs. The floors were of clay and raised about one foot from the ground. Construction work was done by hired labours on payments, not on self- help basis. Site and services were given, community latrines were provided but did not serve the purpose well. They were either filled up or destroyed by cyclone. In Dattapara and Mirpur the community latrines were left unused and the dwellers made their own convenient arrangement, frequently out in the open. The situation in Demra gave a bit different picture. Community latrines were some how being used their. Sewage was collected in huge plastic bags. Latrines were taken care of by a paid latrine supervisor. Still those were not clean enough to be hygienic. Water supply came from tube wells near-by which served the purpose fairly well. There were primary schools and dispensaries for the destitute, one for each camp. These camps, were run by the Government with its own resources along with the contribution from direct participation of international philanthropic organisations like "CONCERN", "WORLD VISION", "RED-CRESCENT", "OXFAM" etc. Provision of other community facilities were in the process of development. Low-priced ration and doles were supplied to them at intervals.

As regards the tenure of land, however, Government has not yet decided whether destitute will be rehabilitated in these camps permanently or any other suitable sites will be provided for. This uncertainty has resulted in a disincentive among the residents for taking proper care of their shelters. They do not feel those huts of their own, but simply holding possession of land with a hope that some day they might be granted a ownership grants. However, in the course of investigation, it is gathered that the settlers are better off in terms of shelter, but worse off in terms of real income. Employment opportunities were very limited in scope and seasonal in nature. Commuting to and from place of work takes away lion's share of their earning and working hours.

Children and women do not have any employment there. They can not commute either. Shelter proves to be a very limited help because of its distant location from the place of employment. The case of Mirpur, however, depicts a different situation. The dwellers there are more or less content with the present condition, not that they do not want more, but they are in a less vulnerable position. Many deserters from the two other distant camps seek refuge in these camps.

Recommendations

About 20,000 people live in the study area. They play a leading role in different sectors of the city activity pattern. Water Development Board has taken a plan to evict the settlers at a subsidy of tk.2,500 per household. But reviewing the slum clearance programme in Dhaka City and different cities of developing countries we may comment that this approach would not be a viable one. So the settlements in this area should not be evicted without a proper resettlement plan. Boat settlement is a new concept in our country to rehabilitate the squatter settlement. Moreover, water supply, sanitation and providing community facilities are difficult in this approach. In the short run, if they are evicted from this place they may again return to this place or to the adjacent area because they have the occupational advantage and also have the community benefit and close affinity in this area. In the long run, under proper relocation benefits they should be resettled to another place of the city. In promoting the cause to return to their own villages or resettle them to any planned village would seem to be almost an unsustainable approach because at the moment they have adapted a new semi urban way of life and an earning provision which would be missing very much in the village environment. Besides these, the present trend of in-migration is difficult to halt unless a proper strategy of development is attained in the countryside. The fallen economy and the degrading rural environment would not offer them a hospitable environment to live with. In this backdrop, in the short run, they should be resettled to the marginal land of the embankment.

Recommendation for short term

About 5000 households who have settled themselves on the embankment have job location mostly within the range of a mile. They enjoy the community benefits in this place. So it would be viable if they are not removed from this place at the moment without resettlement plan. But considering the viability of the embankment these settlements should not be allowed to continue. In this background, resettling the households on the marginal land to settle both the sides of the embankment should be considered. But it is proposed for a short span of time because as the city expands to the embankment the land price on both the sides of the embankment will increase much. So it would be beyond their affordability to pay. So this settlement should be considered for at least 5 to 10 years period of time. The total resettlement aspects such as land ownership, building materials, housing pattern, services and facilities are of paramount importance.

Land ownership: The land at the both sides of the embankment belongs to Water Development Board (WDB). WDB will lease the land for certain period to DCC. DCC will have the right for that period and will also adjust the cost by levying it from the settlers on the basis of monthly instalment.

Housing pattern: The land on both sides of the embankment is beyond the normal flood level. So the houses should be constructed on the stilts.

Building materials: For wall the traditional materials like split bamboo, jute stalk, corrugated iron sheet may be selected. For the pillar bamboo, wooden beam and for roof CI sheet, goal pata and straw may be used.

Water supply and sanitation: The tube well may be reinstalled shifting it to a suitable place. Pit latrine may be erected considering the normal flood level. For this purpose 4 to 5 concrete rings may be used above the ground level.

Recommendation for the long term

The settlers should be resettled to another suitable place in Dhaka City in the long term. To make the programme viable, acceptable and useful to the settlers the planners must take into consideration certain factors of vital importance. Some of which are as follows.

The families must be settled well within the city so that they have easy access to work opportunities close to their dwelling places. The settlements must be so placed that it would not create nuisance to the city environment.

The families must bear the cost of their dwelling units, which shall be realized in instalments over a reasonable span of time. This necessarily means that any workable theme will have to be such that the cost per dwelling unit is within the limit of affordability of a typical squatting family. The family is provided with the necessary amount of loan that is to be paid back in monthly instalments over a period of ten to fifteen years.

The expenditure for plots, services and facilities for low-income dwellings shall not exceed the amount which the dwellers can afford. Besides, the services and facilities should be optimum, because if the provided services and facilities are more than the requirements of the beneficiaries, they would sell their houses for extra gain.

Insurance of tenure security, services, infrastructure facilities near the dwellings and adequate transport facilities with minimum cost to the places of works are important.

Site and services scheme: A sites and services scheme is recommended for the low income households of the area. The Government can provide them khash lands for housing, infrastructure, and services with subsidization. They will also be provided khash lands for kitchen gardening, poultry farming, fish culture, cottage industries etc. The project may provide 15 sq. meter to 40 sq. meter of lands for each household for their housing. Extra land will be provided for infrastructure such as access roads, secondary roads, footpaths, markets, schools, mosques, community centres etc. The beneficiaries will be provided sanitation, water supply, garbage disposal system, electricity, health facilities, primary health education etc. but no house will be constructed by DCC. The beneficiaries will construct those houses themselves with available materials according to the given design by the Resettlement Committee. Four families will share the facilities of one sanitary latrine, one water source and one kitchen. The Government will recover the expenditure from the beneficiaries for the provision of services and facilities within minimum down payment at a monthly instalment for a period of at least twenty years.

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Abbreviations and Terminology

BIP - Bangladesh Institute of Planners.

DCC - Dhaka City Corporation.

DIT - Dhaka Improvement Trust.

DMDP - Dhaka Metropolitan Development Plan.

DSMA - Dhaka Statistical Metropolitan Area.