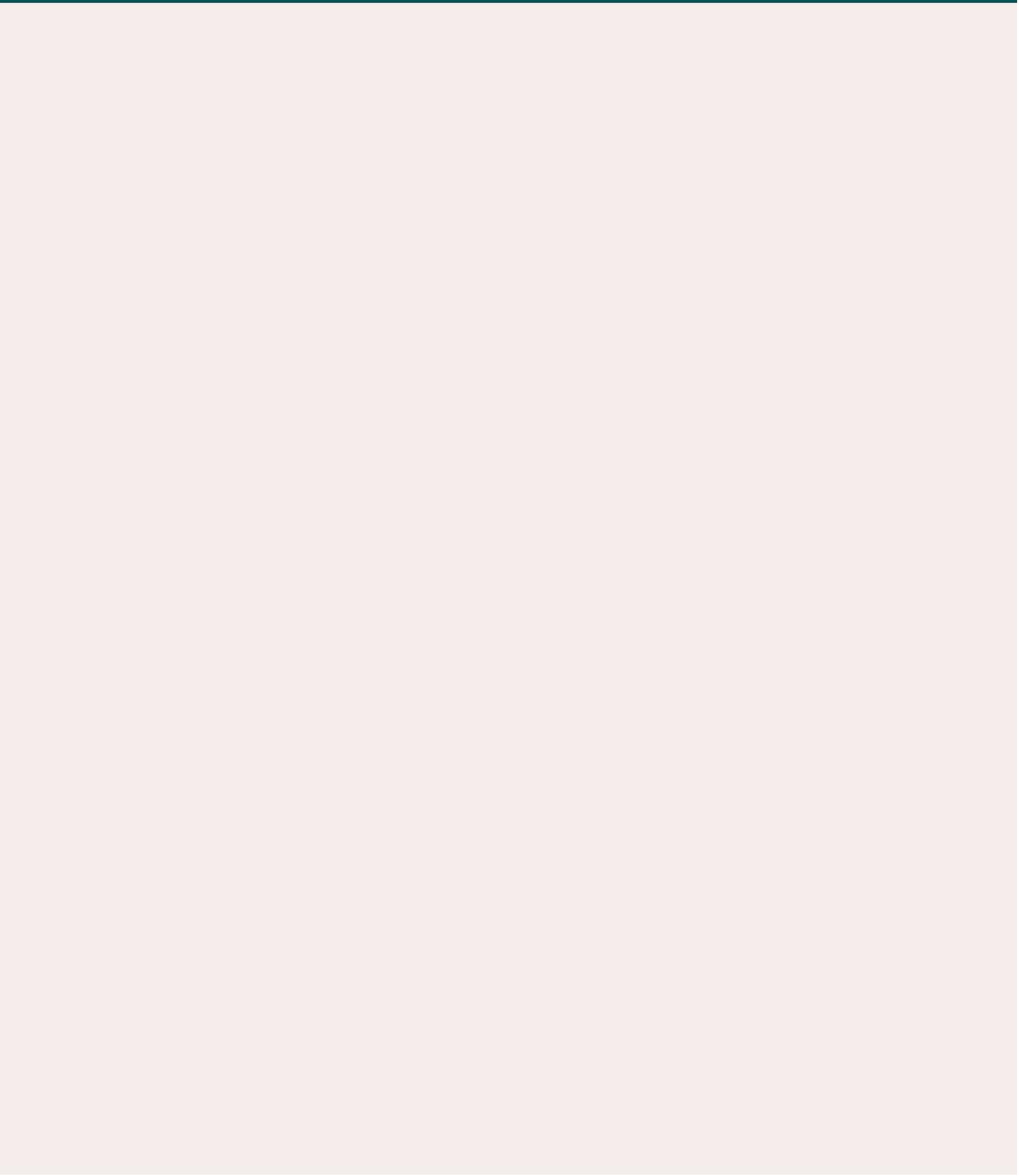


DPZ *04*

BAKALIA-CHANDGAON



4.4 DPZ-04: BAKALIA-CHANDGAON

4.4.1 EXISTING SITUATION

a) Location and Administrative Boundary: The Zone is situated to the east of the city. It is bound by the Karnaphuli River on the east and south, the Halda River on the upper eastern portion, and the Nawab Sirajuddowla road, Kapashgola Road, Kothiber Hat and Chan Mia road in the west. The Patharghata and Boxirhat wards are in the west. The area covered by zone consists of Chandgaon and Bakalia Thana and seven wards which are 4, 5, 6, 17, 18, 19 and 35.

b) Population: In accordance with the Population Census, the population has increased from 238,524 in 1991 to 382,248 in 2001 and is projected to be 702,650 in 2015. The highest population density is in South Bakalia.

c) Land Ownership: Most of the land within the area is under private ownership. A significant size of land is under public control as for examples educational institutions and land of the Port Authority such as at Nazir Char. The port controls the riverside lands.

d) Socio Economic Condition: According to the socio economic survey it is observed that the HH size ranges from 1 to 12 members. Most of the families consist of 4-6 members in DPZ 04. 51.50% of the total population is male and 48.50% is female.

Approximately 23.18%, 21.71%, 20.21%, 12.50%, 17.28%, 13.36 and 16.17% have completed secondary education in Ward 04, Ward 05, Ward 06, Ward 17, Ward 18, ward 19 and Ward 35 respectively. Most people are engaged in small and middle scale business. Livelihood on furniture industry and agriculture such as fish cultivation, livestock and poultry is high.

4.4.2 EXISTING LAND USE AND DEVELOPMENT STATUS

a) Residential: There are 43,086 structures in this area of which 30% pucca, 37% semi pucca, 24% tin sheds and 9% katcha. Of the total structures some

35,509 are used for residential purpose. Residential growth has largely taken place at Baubazaar, Chawkbazaar and Bahadderhat, in an unplanned manner along narrow roads and lanes. High-density residential development is also present along both sides of Mia Khan road, K.B. Aman Ali Road, Khawja Road, Balir Hat and Kalurghat/Kaptai road.

It also extends in a scattered manner in different parts of the area. The planned Chandgaon R/A has been developed by CDA. Phase 1 of Kalpalok housing has recently been handed over. The Nur Nagar housing has been developed by the private sector with approval from CDA.

A number of ponds have been filled to create residential sites. Due to rapid urbanization, the remaining vacant lands are being put to urban use through individual scattered efforts without proper access, drainage provision and urban amenities.

b) Industrial: There are around 306 manufacturing and processing industries in this zone. The Chaktai Area in Bakalia is a leading industrial and commercial activity centre. A large number of industries depend on water (river and canal) transportation. Industries consist of, rice, flour and oil and saw mills, ice and soap manufacturing, boat building and repair docks.

A few soap industries are seen along the Mia Khan road. The Balir Hat has a concentration of furniture making and display shops. Furniture produced in this area serve the city.

There are planned industrial estates at Mohra and Kalurghat, developed by CDA. However, many plots remain underused and vacant. Large industries exist in different parts of Bakalia and Chandgaon area such as the Osmani Glass factory, private textile, and paper and garments industries.

c) Commercial: Approximately 4,152 commercial structures have been recorded of which most are small retail shops. Wholesale business in tin, steel, groceries, plastic goods, fishing, clothes, bamboo is common. Economic activities of this area are of

Table 4.4: Existing land use features of DPZ-04

Sl. No.	Type of use	Area (in acre)	Percentage
1	Agriculture	925	11.29%
2	Commercial	282	3.44%
3	Education & Research	46	0.56%
4	Manufacturing & Processing	540	6.59%
5	Mixed Use	676	8.26%
6	Office Use	44	0.54%
7	Open/Community Space	149	1.82%
8	Residential	1015	12.38%
9	Service Facilities	29	0.35%
10	Transportation	479	5.84%
11	Vacant Land	1982	24.18%
12	Water Body	1629	19.87%
13	Miscellaneous	399	4.88%
Total		8195	100%

Source: Land use survey, 2006-2007

regional interest. A large number of bank branches operate to facilitate business.

Kalurghat growth centre mentioned in the Structure Plan 1995, is situated in the northeastern side and near to Kalurghat Bridge of the DPZ-04.

d) Topography and Drainage: Topographically this zone is almost flat and gently sloping towards the east. However, the vast plain area can be divided into at least three morphological units, which are alluvial plain, marshy land and mud flats. A wide part in the west and north is the alluvial plains, which is fringed by relatively low-lying marshy lands. The drainage condition of this marshy land is very poor. The area along the Karnaphuli course is the mud flat, which is criss-crossed by tidal-creeks. Some important khals passing through this area are Chaktai khal and Chaktai diversion khal, Rajakhali khal, Tulatuli khal, Dhomkhali khal, Noa khal and Krisnakhali khal. These khals are primarily tidal in nature and play a vital role in discharging storm water into the Karnaphuli.

e) Transport

Road Network: This is a relatively less developed

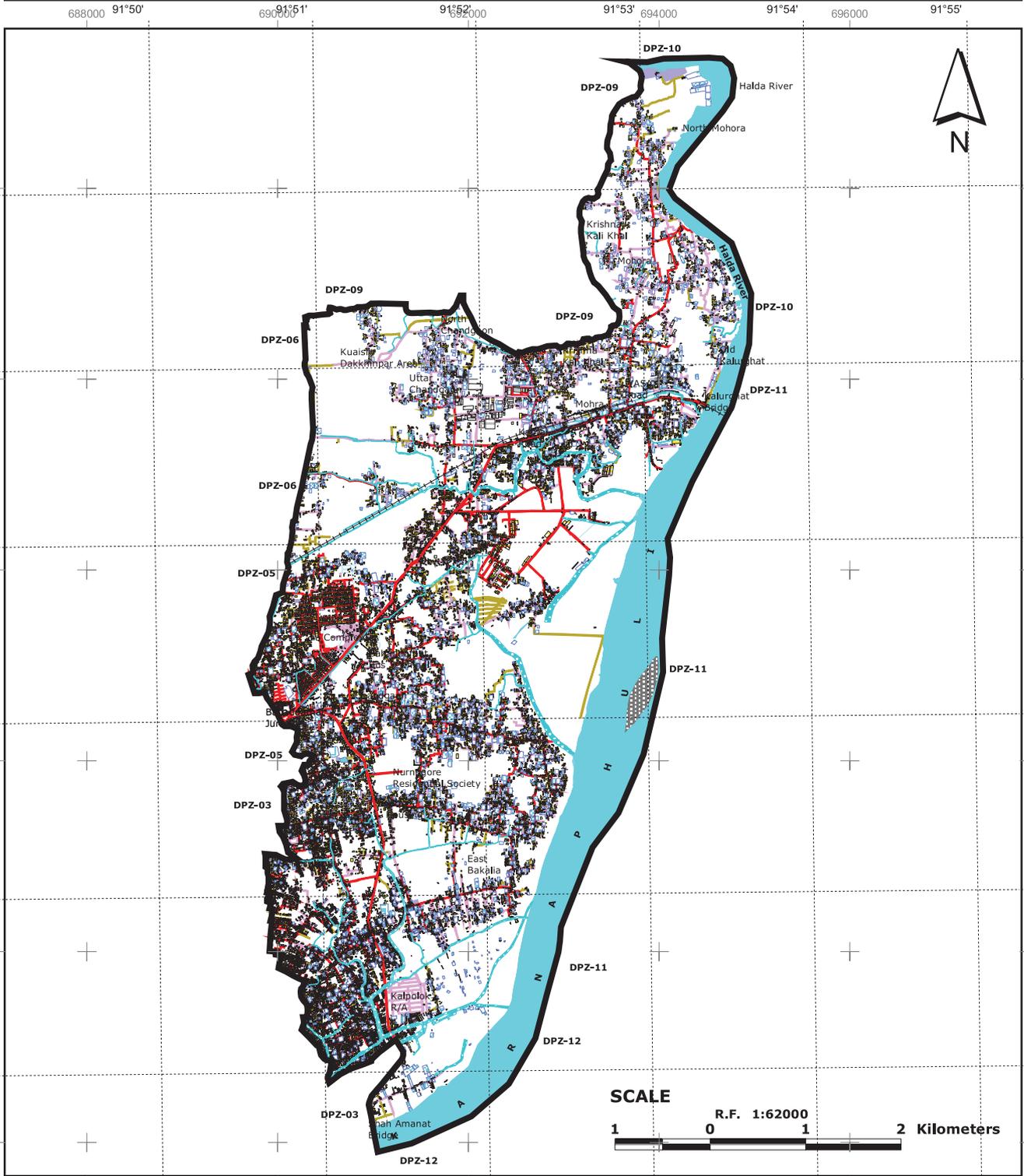
zone of Chittagong. Road network in this area is in a poor state and does not follow any regular pattern. The Karnaphuli Bridge Approach Road is one of the most important primary roads in this area. This road can be part of a future primary network in the north-south direction. Another major road is Kaptai Road from Bahadderhat Moore to Kalurghat Bridge, which is an east-west



Pic. 4-29 Karnaphuli Bridge Approach Road.

connection. There are some minor roads in this area namely Mia Khan road, K.B. Aman Ali road and Khawja road but alignments and inter-connections of these roads are poor. Western part

FIGURE 4.7: EXISTING LAND USE MAP OF DPZ- 04 (Bakalia-Chandgaon)



LEGEND

Existing Structure

- Residential
- Commercial Activity
- Community Service
- Education & Research
- Governmental Services
- Manufacturing and Processing Activity
- Miscellaneous
- Mixed Use
- Non Government Services
- Service Activity
- Transport & Communication
- Agriculture

Existing Waterbodies

- Marshland
- Ditch
- Pond
- Khal
- River
- Drain
- Bridge

Existing Road

- Pucca Road
- Semi-pucca Road
- Katcha Road
- Rail Line

of the area has been developed in very tight form particularly at Baubazaar, Chawkbazaar, Dewanganj, Kurbaniganj, Bahadderhat and their adjoining areas. Access roads are very narrow and congested in East Sholashahar and West Bakalia. The link roads between the industrial and commercial areas at Chaktai and Karnaphuli Bridge Approach Road are narrow, congested and have poor surfacing.

Water Transportation: Water transport along Chaktai Khal, Rajakhali Khal, Tulatuli khal and their branches within the study area are used as cheapest mean of transportation from and to Chittagong. Chaktai area situated on the bank of these khals at the southern end of the study area is an important commercial centre.



Pic. 4-30 Existing canals keep pivotal role in water transport system of the city.

f) Community Facilities

i) Health Services: There is no large hospital. Approximately 25 small hospital, clinic and diagnostic centres are situated at Bakalia and Chandgaon area.

ii) Education: Around 276 educational institutes are present consisting of primary and secondary schools, college and training centres.

g) Utility Services

i) Water Supply: Water supply line exists along the roads of Bakalia from which individual connections are provided to those who can afford it. Supply is irregular and has poor quality. Therefore, use of shallow tube wells is common. As the ground water table is going down, shallow tube wells are becoming inoperative.

Deep tube wells are being sunk and are preferred as water supply from WASA is irregular. NGOs have assisted in providing deep tube wells to the urban poor. General residents of East Bakalia install deep tube well for drinking water supply use pond for other domestic purposes.

ii) Gas and Electricity: Gas and electricity supplies are available in the built areas to those who can afford to pay for connections. Mud ovens are still used by the poor.

iii) Drain and Sewerage: Roadside drains are of insufficient dimensions; vary in width and in poor conditions. Some dwellings have septic tank but in many cases sewage is discharged directly into khals or deposited in open latrines. With the help of NGOs some households have established sanitary ring latrines.

iv) Solid waste: There is no proper solid waste management system in this area. People dump waste indiscriminately along the roadside, drain, pond and canal, polluting the surroundings.

h) Leisure, Recreation, Parks and Open Spaces: The Zia Smriti Complex is located near to Chandgaon Residential Area. There is no other defined park



Pic. 4-31 Zia Smriti Complex.

i) Culture and Heritage: Fishermen Village has been developed over the past years in the mid-eastern side of this zone along the Karnaphuli River. Their livelihood depends on Karnaphuli River and other water bodies by catching fish and sells it to the local market. There is also

Borua Para (Buddhist Area) located in the east-south side of the Arakan Road in this DPZ.

- j) Agriculture:** A large amount of land is used for agricultural purpose. Irrigation water is used for cultivation. Approximately 300 poultry farms and a large number of fish farms contribute to the local economy of Bakalia.

The generalized Land use pattern of this area is the unplanned commercial zone in the south, planned residential area at Chandgaon, sporadic unplanned housing in between Chaktai and Shah Amanat Bridge approach road, planned industrial zone in the north and huge vacant area along the river side. However, some environmental issues in this planning zone are:

4.4.3 EXISTING ENVIRONMENTAL ISSUES

- i) Water logging:** An environmental concern in this zone is severe water logging. The worst affected are the lowlands of Bakalia and Chaktai. The main causes are siltation due to hill cutting and hill erosion in the uplands, encroachment of



Fig. 4-32 Halda River- Only one natural breeding ground of local carps in the country

khal banks, depressed marshy lands in the south and east, and artificial obstacles across the drainage system.

- ii) Halda River front:** Halda river is the only natural breeding ground of the local carps (such as Ruhi, Katol, Mrigal and Kali Baous). The River offers a typical environment for such carps to breed during first onset of the monsoon. However, in recent times, due to alteration of the Halda bank-line geometry, particularly modification of shoreline bends, this natural unique ecosystem is under threat.

iii) Halda River Ecology: Near Kalurghat, the Halda River meets with the Karnaphuli as its tributary. Halda River is tidal in nature, but is very low in salinity. However, the extraction of surface water at Madunaghat site might increase the salinity limit of the river water. From the Kalurghat bridge point towards north, the Halda river reach is a special ecological zone.

iv) Ponds and Water bodies: A large number of water bodies of different sizes are present, mostly near human settlements. The entire communities use some large ponds. Such ponds play an important role in environmental enhancement.

v) Industrial Pollution: Some industries in the Kalurghat I/A, and outside, produce toxic wastes and effluents. Untreated effluents are discharged into the Karnaphuli River. The alarming pollution level is a threat to aquatic life.

vi) Sand Mining from Karnaphuli: Karnaphuli riverbed is a source of sand quarrying. In between the Kalurghat and Shah Amanat Bridge tons of sands are mined in a traditional and unscientific way. This might have effect of river morphology and hydro-dynamics.

4.4.4 HIGHER LEVEL PLANNING

a) Structure plan 1995: Structure plan has identified Bakalia as one of three expansion areas of the city. Close proximity to the existing city areas and quick and easy connection, which will be achieved with the construction of the proposed road along the Karnaphuli, makes it a viable option as an immediate expansion area.

b) Urban Development Plan 1995: The following issues, problems, opportunities and required actions have been recognized in the Bakalia area in the Urban Development Plan. These are:

Major issues and problems

i) Susceptibility to limited impact from cyclonic surges

ii) Susceptibility to seasonal flooding from the Karnaphuli: During monsoon and high tides a significant portion of land in this area is inundated. Flood level of this area can be categorized into three sub zones such as:

Sub Zone 1: North east of the Karnaphuli River Bridge Approach Road, is inundated to a depth of 5 feet. Water remains in this zone for a few weeks due to unplanned construction of roads without required provision of culverts for drainage.

Sub Zone 2: The north of the junction of Chaktai and Rajakhali Khals. This zone is flooded in the monsoon to a depth of 4 to 5 '. Flood water remains for a few hours.

Sub Zone 3: The area between Karnaphuli River and Rajakhali khal is inundated during the monsoon to a depth of 6 to 8 feet. This area is also affected by regular tidal flooding.

iii) Haphazard development of urban fringe areas: Areas along the Chaktai khal have developed in an unplanned way with narrow and irregular road network. Adequate space for road and drainage network is mentioned in the CMMP as a prerequisite for urban development. Forward planning practice must be established to change this situation.

iv) Presence of slum and squatter areas: A large number of slums exist in the area.

v) Lack of direct access into the city: The Karnaphuli Bridge Approach Road is the only major north south access to the city. There is no major access in the east west direction.

vi) Congested Chaktai Commercial Centre: Access to the Chaktai commercial area is poor. Roads are narrow and congested due to loading and unloading of goods in the streets. There are

only two bridges crossing the Chaktai Khal namely Chamrar Gudam Bridge (approx. 20 ' wide) and Khatunganj Bridge (approx. 10 '). This causes severe congestion.

Opportunities

i) Proximity to the existing urban area: The Bakalia area is within half to one kilometer of important commercial centres at Anderkilla and Chawkbazaar area and within 2 km of Kotwali junction. It has thus been identified as a peripheral expansion area.

ii) Road leading to new crossing of the Karnaphuli River: Karnaphuli Bridge and Karnaphuli Bridge Approach Road are important parts of the strategic road network of Chittagong. This Approach Road passes through the heart of Bakalia which has significantly improved accessibility into the area, thereby encouraging development.

iii) Chaktai Commercial Area: Chaktai is an important commercial centre. Its renewal can greatly increase business prospects.

iv) Proposed east-west link road in the Structure Plan: In the Long Term Development Strategy for Traffic and Transportation, a major east west link road is proposed between Strand Road and the junction of Karnaphuli Bridge Road and its Approach Road. To complete the City's primary road network, this link is highly recommended in the Structure Plan.

When this road is constructed it will provide a major access between Bakalia and the City centre. This opening will lead further development in Bakalia area.

c) Storm Water and Drainage Master Plan CMMP 1995: The DPZ 04 covers the entire area of Drainage Area No. 5a, Drainage Area No.5b, Drainage Area No. 7 and Drainage Area No. 9 of the Storm water and Drainage Master Plan of the CMMP. The prime proposals given for the area are khal rehabilitation, new primary khal, new secondary khal, flood storage pond, regulator.

d) Long Term Strategy for Traffic and Transportation Master Plan CMMP 1995: Major long-term proposals are to construct road cum

embankment along the Karnaphuli River. This Master plan proposes a number of east-west and north south connection roads.

4.4.5 DETAILED AREA DEVELOPMENT PROPOSALS

The following development proposals have been shown in *Figure no 4.8*.

a) Residential (Housing)

R-04-01/R-04-02: The Chandgaon R/A and the Kalpalok R/A have been developed by CDA. Standards for provision of urban facilities and urban amenities have not been determined and needs to be ascertained. To ensure sustainability of planned areas CDA has to ensure adherence to building setback, provision of footpaths, mandatory open spaces at individual and collective levels and provision of adequate urban facilities to support the residential population. Ancillary uses such as small private offices employing less than 10 persons, hairdressers, tailors, retail shops etc. serving the community may be permitted at designated location as per an approved design agreed by the community. Occupation of the new residential site has to be hastened in the areas identified in the figure 4.8.

R-04-03: The new residential areas may be extended to accommodate all income groups (HI/MI/LI) in proportions stated in the guidance notes (Annex-2). Small-scale urban facilities (ancillary use) to support the local communities have to be incorporated. Employment opportunities of LI communities have to be considered and designed. The areas somewhat in the centre (both sides of K.B. Aman Ali Road and Khawja road) of the zone may be developed for all income groups (HI/MI/LI). Comprehensive development can only be achieved with large-scale development by a single authority through land readjustment techniques where it is required (Plan Implementation, Chapter-5). A major hospital and other urban facilities (ancillary use) and amenities will be incorporated. Guidelines and standards are provided in guidance notes (Annex-2).

R-04-04: To the north of the rail track is a

spontaneously growing semi urban area. The Authority may guide the planned growth of the area for a MI and LI residential community through land management techniques. Opportunities for small commerce and urban facilities have to be incorporated.

R-04-05: Borua Para located on the south of Arakan Road is a Buddhist predominant area. This study recommends to upgrade this area by providing required neighborhood services and facilities in consultation and co-operation with the local people. In this case, land readjustment technique may be introduced here.

R-04-06: The DAP study proposes the area on the east of Kalurghat Industrial Area as predominant residential use. Industrial workers will get highest priority to live in this place but middle-income group may also have access to this area. Besides, a certain portion may be used for other purpose through proper consideration of the concerned authority.

R-04-07: Taking into account the existing land use, the present study recommends this site for residential use. Attempts need to be taken to make access road, community facilities and open space in the area.

R-04-08: These areas cover existing unplanned residential areas, industrial areas and commercial areas. These areas can be redeveloped with different planning techniques like Land Readjustment, and Site and Services Scheme. The commercial area near to Laldighi may be redeveloped by these techniques. Similarly other residential areas can be redeveloped in future for healthy neighborhood environment (Is not shown in the Figure 4.8).

R-04-09: There are few slums developed scattered way into different parts of the DPZ 04. These slum areas can be upgraded in the existing places or relocated as low income housing (High Density) into the suitable locations. In this case, existing landowners will be compensated and provided required aid within the development process (Is not shown in the Figure 4.8).

Implementing Agencies: CDA/NHA/CCC/Land owners/ Private land and housing Developers

Policies: Relevant policies for residential (housing), Chapter-2 and Guidance Notes: Relevant Sections and Sub-sections for residential (housing), Annex-2.

b) Industrial

In-04-01: The Kalurghat Planned Industrial area is grossly underused. The Authority must liaison with the relevant Authority to ensure full utilization. The environmental conditions of these estates must be significantly improved. No further land should be designated for industries unless these serviced plots are fully utilized under a legal mechanism. A tentative buffer zone must remain with plantation and green surrounding the industrial areas that may vary from 50ft to 150ft on the basis of prevailing physical situation of particular places. Owners of the industrial plots will be responsible to provide the required land for this buffer zone.

In-04-02: The Bakalia area is prominent for furniture making. An area located Bolirhat and its environs, near to Karnaphuli River bank, may be further developed in a planned manner for expanding this activity and other small-scale industries. Facilities may be incorporated to



Pic. 4-33 Furniture industry can promote local economy of this zone.

facilitate tourism visitor facilities. Reserves may be made for large formal display and exhibition areas, warehousing and parking areas. In most cases, furniture is made in and around homes. Considering this practical situation, to support furniture industry, residential and some commercial uses can be provided in this strip of land.

Implementing Agencies: CDA/BCIC/BSCIC

Policies: Relevant policies on industrial and commercial use, Chapter-2 and Guidance Notes: Relevant sections and sub-sections of Guidance Notes 7 and 8, Annex-2.

c) Commercial:

Com-04-01: Current haphazardly commercial development in and around the Bahadderhat junction may be developed in a high class



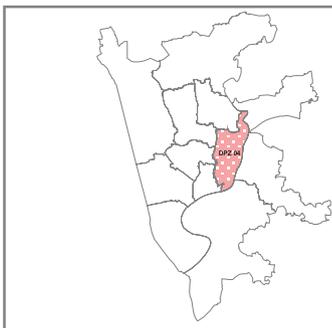
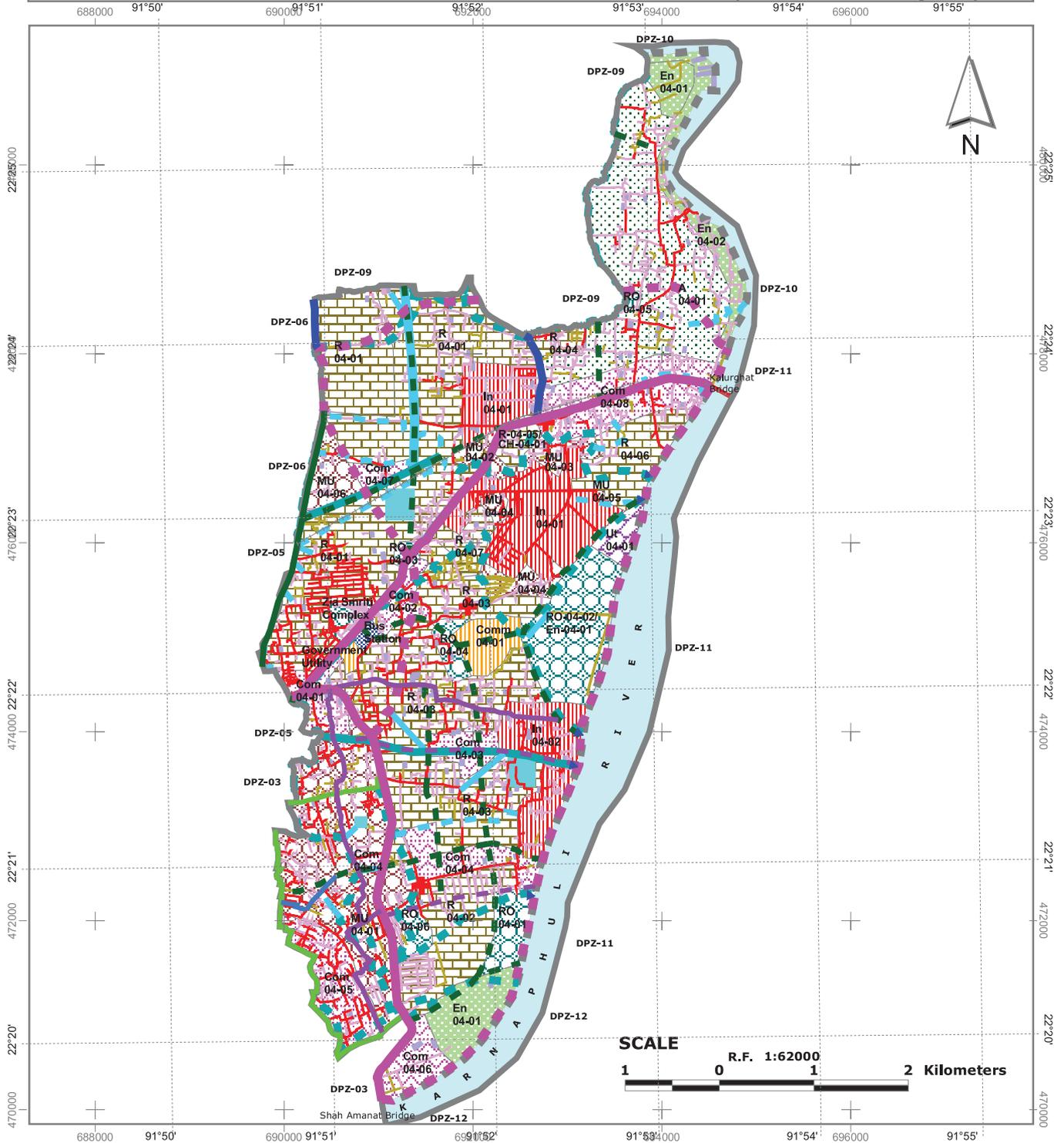
Pic. 4-34 High class commercial centre may be developed around the Bahadderhat junction.

commercial centre, with sufficient offsets from the roads, wide public plazas, adequate parking facilities and bus bays. Buildings may be of unlimited FAR with maximum plot coverage of 40%. Buildings will have to be of high architectural standard. These conditions will be same for the area **Com-04-02** located to the south east of Arakan road and near bus terminal.

Com-04-03/Com-04-04: Predominant commercial use in planned manner is recommended on the west of furniture industry as well as on the north of Mia Khan Road.

Com-04-05: An area between the Chaktai and Chaktai diversion khal will be improved for development into a major planned warehousing and commercial centre. The Authority will ensure adequate access provision, off street parking and loading and unloading areas, adequate footpaths, and public open spaces. In addition, some other required uses can be encouraged here, for example

FIGURE 4.8: PROPOSED LAND USE PLAN OF DPZ-04 (Bakalia-Chandgaon)



KEY MAP

LEGEND

Proposed Landuse

- Residential
- Commercial
- Industrial
- Mixed Use
- Community Facility
- Utility Facility
- Environmental Protection/Enhancement
- Education
- Recreation, Leisure & Open Space
- Culture and Heritage
- Transport Related Use
- Agriculture
- Retention Pond
- Flood Storage Pond/ River
- Tidal Regulator
- Hospital
- Railway Line

Proposed Road

- Road 120'
- Road 60'
- Road 40'

Widening Road

- Road-120'
- Road-100'
- Road-60'
- Road-40'
- Road-30'
- Road-20'

Proposed Drainage and Embankment

- Embankment
- Primary Khal Rehabilitation
- Secondary Khal Rehabilitation
- Proposed Primary Khal
- Proposed Secondary Khal

Existing Road

- Pucca
- Semi-pucca
- Katcha

residential and ancillary use considering existing situation.

Com-04-06: This area located adjacent to the north east side of Shah Amanat Bridge Approach road can be used for commercial dominating and other uses.

Com-04-07: The area situated to the south of the Anannya R/A may be used as predominant commercial use. In addition, other required uses may also be allowed here proportionately. Access road and parking facilities have to be designed to serve commercial activities.

Com-04-08: Along the both sides of Arakan road that is located from Kaptai road till Kalurghat Bridge, can be considered to use as commercial dominating area. Besides in a certain scale other uses (residential, light industry and community facilities) may also be permitted.

Implementing Agencies: CDA/CCC/PWD/other relevant Government Agencies/Private developer companies/Land owners.

Policies: Relevant policies on industrial and commercial use, Chapter-2 and Guidance Note 9, Annex- 2.

d) Mixed Use

MU-04-01: The area between Chaktai Khal and Shah Amanat Bridge Approach Road may be guided to grow as planned mixed-use areas. The Authority will ensure upgrading of the area and protect it from localized flooding, improve access provisions and open spaces.

MU-04-02/MU-04-03/MU-04-04/MU-04-05:

These sites adjoining to the Kalurghat industrial area are suggested for mixed use in planned manner with good accessibility. Water based recreational facilities will be highly encouraged based on existing water body (khal).

Implementing Agencies: CDA/NHA/CCC/PWD/Land owners/ Private land and housing Developers

Policies: Relevant policies, Chapter-2 and Guidance Notes: Relevant notes, Annex-2.

MU-04-06: This triangular shape site is recommended as mixed-use area.

e) Drainage: According to the Chittagong Storm Water Drainage and Flood Control Master plan, 1995, DPZ 04 comprises the whole area of Drainage Area No. 5a, Drainage Area No.5b, Drainage Area No. 7 and Drainage Area No. 9 of the Drainage Master Plan. Under the DAP some additional drainage works are recommended. These are detailed below:

Drainage Master Plan Proposals:

1. Rehabilitation of Chaktai khal, Noa khal and Uttara khal.
2. Eleven secondary new khals in different parts of DPZ- 4.
3. Two Primary khals of which one is 65 feet wide recommended within Bakalia Area and its tentative alignment lies in between K. B. Aman Ali Road and Khawja road from Chaktai khal at Bahadderhat to the Karnaphuli River and the other along the northern side of railway track parallel to Arakan Road and opposite side of Osmania Glass Factory.
4. Four regulators on khals flowing into the Karnaphuli River.
5. Two flood storage ponds, one is 9 hectare in Bakalia area and the other one is 10 ha in Chandgaon area.
6. Flood defense is proposed on the right bank of the River Karnaphuli up to Kalurghat Bridge

DAP proposal:

1. To protect the existing khals from encroachment, a green corridor reserve is proposed on both sides.
2. Rehabilitation of Tulatuli khal and other khals not covered in the Storm Water Drainage and Flood Control Master Plan, 1995, has to be rehabilitated. Retaining and preservation of 214 ponds of 0.5 acre and above are mandatory. The accumulated size of these existing ponds and dighis proposed for preservation is approximately 162 acres. These ponds are identified in figure 4.8.
3. The study recommends three additional regulators on the khals flowing into the Karnaphuli River.

4. Following drainage-guiding principles/guidelines C at page from 3-3 to 3-4 remaining drainage networks is proposed and identified in the proposed land use plan of Figure 4.8.

5. Where not shown specifically in the land use map, drainage guiding Principles/guidelines will apply.

f) Transportation: In order to promote development in this DPZ in an organized manner, a number of primary and secondary roads are being proposed for development. The details are as follows:

1.0 Embankment-cum-Road: In order to promote future development in this zone of Chittagong city, it is important to protect the bank of the river by constructing an embankment-cum-road along the Karnaphuli River from Shah Amanat Bridge to Kalurghat Bridge, which will be the eastern boundary of Bakalia and Chandgaon Area. This embankment-cum-road will extend from Karnaphuli Bridge Approach Road to the south-west up to Strand Road, but from Kalurghat Bridge to Madunaghat it will extend as embankment only. ROW of the embankment-cum-road would be 200 ft from Strand Road to Shah Amanat Bridge and 300 ft from that point to Kalurghat Bridge

2.0 East-West Connecting Road: In order to develop a grid-iron pattern of road network, a number of important east-west links have been proposed for both Bakalia and Chandgaon areas. Most of these links will have a ROW of 60 ft. and the rest will have ROW of 40 ft, except 2-more major east-west links, along the outer bypass, road. For details, Please See: Figure 4.8

3.0 North-South Connecting Road: The Detailed Area Plan also proposed some important north-south roads in Bakalia and Chandgaon Area. One of these is an extension of Karnaphuli. Approach Road to the north, which will be partly of 120 ft ROW and partly of 100 ft ROW. The remaining north-south links are mostly of 60 ft. ROW. For details, please see Figure 4.8

4.0 Road Widening: The other existing roads in this zone are not wide enough to provide smooth

circulation. It is, therefore, proposed to widen these roads as much as possible, say up to 30 ft. For details, please see Figure 4.8.

g) Community Facilities:

Comm-04-01: An area near to the centre of this zone can be reserved for education and research purposes. University, colleges, library, arts centre etc. may be established here in an urban setting befitting the related use. Student residential facilities may be incorporated.

Implementing Agencies: CDA/CCC/other relevant Government Agencies/Private developer companies.

Policies: Relevant sections of the policies on community facilities, Chapter- 2.

h) Leisure, Recreation, Parks and Open Spaces:

There is no sufficient facility for recreation activities in this area. For better mental and health improvement of the local people it is mandatory to provide land for different types of recreation activities like parks, play ground, green and sports complex. Taking into consider this demand for recreational purpose the present study of DAP recommends a certain amount land in the study area.

RO-04-01: An area eastern side of CDA Kalpalok R/A up to Karnaphuli River bank, may be developed as a river side amusement such as sport, leisure centre etc.

RO-04-02: The triangular area south of the I/A and near to Karnaphuli River may be reserved for an urban park. A butterfly park may be incorporated which may operate as a commercial venture.

RO-04-03: The junction of existing Arakan road and proposed new major road should be developed as a junction square park adorned with landscaped garden and sculptures. This will also apply for RO-04-04 and RO-04-05.

RO-04-06: This area located to the west of Kalpalok R/A can be developed as park, civic centre and lake etc.

RO-04-07: There is no sufficient facility for recreational activities in this area. For better

mental and health improvement of the local people, it is mandatory to provide land for different types of recreational activities as for example, parks, playground, plantation and sports complex. Taking into consideration this demand for recreation purpose, the present study of DAP recommends for a certain amount of lands where it will be suitable in this DPZ (is not shown in the Figure 4.8).

Implementing Agencies: CDA/CCC/Parjatan corporation/other relevant Government Agencies/Private developer companies.

Policies: Relevant policies on leisure, recreation and open space, Chapter- 2 and Guidance note: 10.

i) Utility Services:

Ut-04-01: A Sewerage Treatment Plant is proposed to the East side of Kalurghat Industrial Area.

Ut-04-02: The present DAP study recommends that the responsible agencies for the provision of utility services, will prepare their own detailed plan in respective fields.

j) Culture and Heritage:

CH-04-01: The 'Borua Para' located to the south of Arakan Road, is a settlement of an ethnic group. There is a big Mandir in this site. The area is recommended for cultural conservation. The physical condition of this neighborhood is poor. The Authority will ensure its enhancement and improvement, through provision of drainage, access roads and playgrounds.

Implementing Agencies: CDA/NHA/CCC/other relevant Government Agencies/Private developer companies.

Policies: Relevant policies on culture and heritage, Chapter- 2.

k) Agriculture:

A-04-01: There are lots of agricultural activities in this DPZ like fairies, paddy land and poultry firm. Considering the economic importance of agricultural activities in local peoples' life the study recommends retention of a large amount of land for agriculture use. Besides, existing homestead can be retained as well as allowed further development in future.

4.4.6 ENVIRONMENTAL PROTECTION AND ENHANCEMENT

En-04-01: Considering the spectacular riverside view of the Karnaphuli, three riverside forests have been proposed so as to enhance the physical environment of the City. Mangrove forests under a natural environmental setting are recommended on the west bank of Karnaphuli. Artificial blockage should not be allowed to obstruct the natural tidal inundation of these two forests either due to the proposed highway along river or by any other means. These two forests will be rich in biodiversity and may also be a wildlife sanctuary.

Another natural forest needs to be generated at the northern most trip of the zone and this should be open for public access, but in a sustainable way.

En-04-02: On both side of the Halda riverbank, a narrow 100m wide belt has to be identified as Special Ecological Zone. No development activities, particularly physical change of shoreline would be allowed and must strictly control. All existing activities, particularly brickfields and sand mining activities, which are harmful to Halda ecology and carp breeding process, need to be stopped and removed.

En-04-03: To enhance the city environment and make it habitable, it is necessary to build some parks and new Urban Green blocks in this zone. Some such locations are at Chandgaon crossing, near Kalpalok RA, and south of Noa khal mouth. This green park should be kept open for public visit and leisure.

En-04-04: Industries are the major source of water and soil pollution in this area. The Authority will liaison with the DoE to stop all forms of pollution. Setting up of Industrial Waste Treatment Plant, either by individual industrial unit or group of units of similar operation must be ensured.

En-04-05: All major khals should be rehabilitated; backlines should be marked and fixed. Along the backline there should be a buffer zone of green belt, ranging from 20 ft. to 50 ft. wide on both sides. However, for Chaktai diversion khal the bank lines for entire course should be fixed and the green belt can be extended from khal mouth up to

the confluence with Chaktai khal.

4.4.7 PHASING PRINCIPLES AND IMPLEMENTATION GUIDELINES

a) Phasing Principle

The study area Bakalia is flat land and threatened by flood and cyclonic surge from the Karnaphuli River. All the development works recommended before in the Detailed Area Plan of this area is subject to the construction of new Road Cum Embankment along the Karnaphuli River. Before that any massive development is prohibited along the eastern side of Bakalia.

Due to the high liquefaction zone in eastern side of Bakalia generally two storied building will be safe within around 1 .5 kilometers from the bank of the river. But more than two storied building can be constructed with proper Structural and Architectural Design.

b) Implementation Guidelines

Generally Chittagong Development Authority (CDA) is responsible to perform development activities in Chittagong city. Now a day's Private sector and NGOs are keeping important role into different fields of development activities of the society. CDA can implement its development works in cooperation with NGOs and Private Sector.

