4.6 INFRASTRUCTURE DEVELOPMENT PLAN

4.6.1 Approach to Planning

Under the current Additional Study, the URRP infrastructure development plan is reviewed in the light of the latest situation and it is concluded that there is no need of change/amendment for the most of sectors. However where necessary, the plan is extended up to the year 2015 or updated to absorb the changes in the situation which occurred after completion of Final Report (1) of URRP. Table 4.6.1 summarizes the approach to the infrastructure development planning in the Additional Study.

Infra	astructure Development Planning under Additional Study	Sector/Project				
1	Full use of URRP Plan	Water supply, health, education, flood control, ferry terminal, disaster preparedness				
2	Supplementary report to URRP Plan	Solid waste management, waste water treatment, housing				
3	Modification of URRP Plan	Roads, urban drainage				
4	4 Additional Plan Electric power supply, tel-communication					

 Table 4.6.1
 Infrastructure Development Planning

Source: The Additional Study Team

This report therefore presents only (i) Supplementary report to URRP Plan, (ii) Modification of the URRP Plan, and (iii) Additional Plan. The preliminary cost estimate and implementation plan are reported in Subsections 4.6.5 and 4.6.6 respectively.

4.6.2 Supplementary Report to the URRP Plan

(1) Wastewater Treatment and Disposal

According to the URRP Plan, septage generation is estimated to amount 144 m³/day in 2009 and 204m³/day in 2015, whereas the present treatment capacity is limited to 50m³/day. It is reported that UNICEF has committed to construct new septage treatment plant with a daily treatment capacity of 60m³/day adjacent to the existing one. Even after completion of the UNICEF plant, it is not possible to properly treat the estimate volume of septage in 2009. It is recommended that DPK puts forward appropriate action for realization of additional plant in order to avoid any adverse effect on public hygiene and environment.

(2) Solid Waste Management

Currently domestic garbage and solid waste from commercial activities are treated by means of landfill which is located in Gampong Jawa. It is reported by DKP that the existing site is foreseen to be no longer usable owing to a huge amount of debris and other waste generated after the disaster.

According to the URRP Plan, DKP predicts the volume of dumping volume to be approximately 1.3 million m^3 for the coming 20 years and it is necessary to develop a new

land fill site with the area of 25 ha assuming average filling depth/height of 5m.

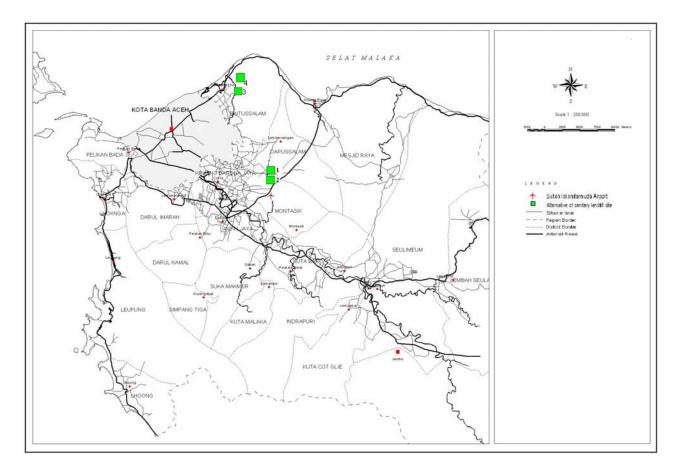
Under assistance of GTZ, the solid waste management study is in progress including selection of landfill sites. As of August 2005, four alternative sites are identified in ABR as shown in Table 4.6.2.

No.	Location	District	Geographic	Surface	Distance to
			Coordinate	Area	Main Waste
				(ha)	Source (km)
1	Koeta Teu	Montasik	772258 / 608169	15	21.5
2	Kleumbang	Darussalam	772258 / 609614	15	22.2
3	Gapang	Baitussalam	767636 / 620611	25	21.6
4	Taleue Seuke	Baitussalam	767873 / 622393	25	17.8

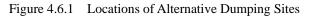
Table 4.6.2Alternatives of Sanitary Landfill Sites

Source: Progress by GTZ, August 2005

The locations of the above sites are as shown in Figure 4.6.1.



Source: The Additional Study Team



In addition to development of new dumping site, it will be required to reinforce collection and

transportation vehicle. URRP has estimated such requirement but it is expected that GTZ study will produce more detailed plan in the light of the latest conditions.

(3) Housing

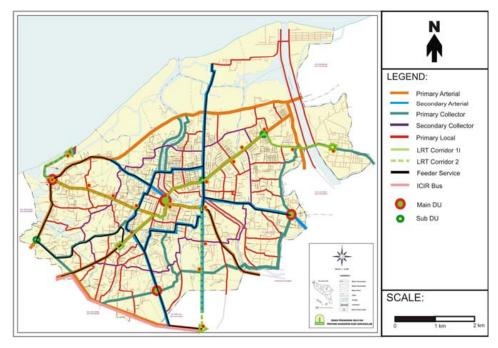
Construction of houses is one of top priority in the rehabilitation and reconstruction activities in BAC, as internally dislocated people have lost their houses. According to BRR plan, new houses of 17,269 are to be built in total, of which 14,161 houses have been committed by donors, NGOs and government. As of February 2006, 2,498 houses completed and 3,383 are houses in progress. Out of the completed houses, 414 houses have already occupied.

4.6.3 Modification of the URRP Plan

(1) Roads

URRP has elaborated road development plan and hierarchy. Under the current Additional Study, LRT concept is however introduced as one of means of land transport. Its pre-feasibility study is expected to be conducted in 2007 under the assistance of the Chinese government. The road development would be required to be adjusted depending on the result of the study and subsequent implementation program by the government. At this stage it is not possible to predict how road development plan would be affected.

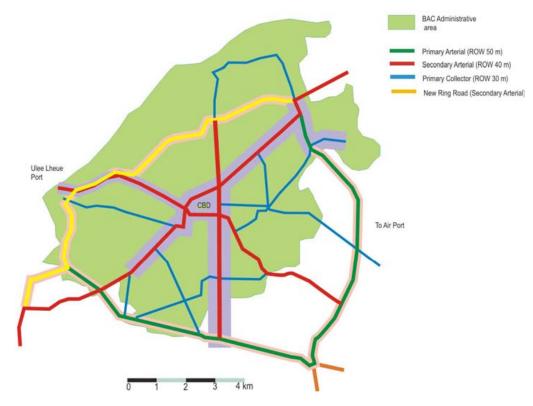
A concept of LRT is studied under the Additional Study as reported in Chapter 2 of this report. Assuming that LRT is integrated into road network, road network in BAC would be as presented in Figure 4.6.2. It should be however be noted that this is just one of cases and not definite plan.



Source: The Additional Study Team

Figure 4.6.2 Road and LRT Network Plan

The road network without LRT is preliminarily studied for the target year 2015. The study is however conservative without traffic volume data. It is therefore recommended to carry out detailed study including traffic survey in future. The road network in 2015 is as illustrated in Figure 4.6.3. In the year 2015 the road hierarchy may be updated as shown in the figure and road network would comprise primary system and secondary system.



Source: The Additional Study Team

Figure 4.6.3 Road Hierarchy in 2015

(a) Primary system

It consists of primary arterial and collector roads. The former connects BAC to satellite cities, growth centers and other urban centers outside NAD. The latter links all the main corners in BAC.

(b) Secondary system

It is also composed of the secondary arterial and collector roads. They support the primary system, and collect rip or traffic from the small unit of village and trip from street.

The alignment of the coastal road, Syah Kuala road and Baru street has been proposed to be modified owing to land constraint.

The road class and their characteristics are proposed to be as presented in Table 4.6.3.

Class of	Types of	Dimensions	Design speed	Width
road	Road			(ROW)
Class 1	Primary Arterials	6 L 2 W/D	>70 km/hr	50 m
	Secondary Arterials	6 L 2 W/D	>60 km/hr	40 m
Class 2	Primary Collectors	4 L 2 W/D	>50-60 km/hr	30 m
	Secondary	4 L 2 W/UD	<50 km/hr	20 m
	Collectors			
Class 3	Primary Locals	2 L 2 W/UD	<30 km/hr	12 m

Table 4.6.3 Road Hierarchy and Their Characteristics

Source: The Additional Study Team

(2) Urban Drainage

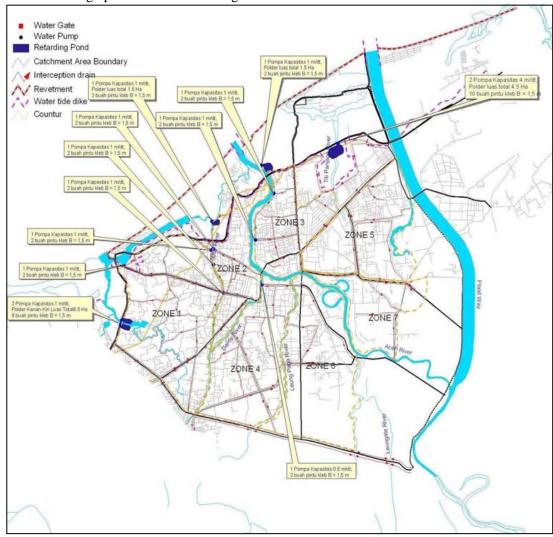
Existing drainage facilities have been completely damaged by the disaster. Prior to disaster the drainage system covered approximately 35 km^2 of the whole area of BAC and is composed of three (3) zones. Because of topography, it was necessary to drain the storm water by means of pumping and there were 8 pumping stations in total. Excepting one pumping station all other pumping stations were washed away and in addition many of flood gates were also collapsed. Even before the disaster low lying area of BAC was subjected to frequent inundation but loss of pumping facilities and gates has resulted in aggrieving the inhabitants by increasing risks of inundation and hampering economic and administrative activities.

The URRP Plan has been prepared based on the review of a master plan on drainage, which was elaborated by PU Dinas. BRR meantime in cooperation with PU Dinas launched to establish a new drainage planning scheme and its study was entrusted to two (2) Indonesian consulting firms. The study was commenced from August 2005 and is scheduled to complete by March 2006. The Additional Study Team has collected both the URRP plan and ongoing plan and compared each other as Tabulated in Table 4.6.4.

Description	URR	URRP Plan Ongo		
A. Zoning				
Number of Zones		3	7	
Drainage Area (ha)	Zone-I	2,900	Zone-1	1,150
	Zone-II	1,120	Zone-2	320
	Zone-III	2,050	Zone-3	320
	-	-	Zone-4	630
	-	-	Zone-5	1,330
	-	-	Zone-6	780
	-	-	Zone-7	380
	Total	6,070	Total	4,910
B. Design Conditions				1
Allowable Inundation Depth	0	cm	0	cm
Allowable Inundation Duration	0	hrs	0 hrs	
Return Period of Design Rainfall	5.	-yr	5-yr	
Design Rainfall (mm/day)	Zone-I		Zone-1	153
	Zone-II	165	Zone-2	153
	Zone-III		Zone-3	160
	-	-	Zone-4	153
	-	-	Zone-5	160
	-	-	Zone-6	169
	-	-	Zone-7	160
C. Runoff Calculation Method		•		
For Channel Design	Rationa	l Method	Rationa	al Method
For Pump Design	Unit II.	dao anonh	Unit II.	udno anonh
For Retarding Basin Design		drograph		ydrograph
D. Planned Drainage Facilities				
Pumping Station	8	locations	13	locations
(Total Capacity)	21.05	m ³ /sec	34	m ³ /sec
Retarding Basin	2	locations	4	locations
	n.a		13.5	ha
	615,000	m ³	270,000	m ³
Primary Drain	51,362	m	n.a	

Table 4.6.4 Technical Comparison of Two Drainage Plans

Source: URRP, PT. Wahana, PT Global



The new drainage plan is as shown in Figure 4.6.4.

Source: PT Global, PT Whama



There is a couple of differences in planning fundamental as follows:

- (a) The URRP plan basically follows the existing PU Dinas plan, which is based on premise that submerged lands would be reinstated to their original state, whereas the ongoing plan is based on the prevailing geographic conditions after the disaster.
- (b) Under the ongoing plan it is pre-determined that the submerged land is separated by means of construction of barrier almost in parallel with the coast line. This subsequently results in reduction of drainage area. In fact the URRP plan has a total drainage area of 6,070 ha, while the ongoing plan is limited to 4,910 ha.
- (c) As a part of the structure plan of BAC, URRP has proposed to construct coastal

road but circumstance after the URRP study revealed that it is probably difficult to align the road along with URRP proposal. Re-alignment is required accordingly, which also affects zoning of drainage area.

There are a lot of differences in many planning and design items between the URRP plan and the ongoing plan. The ongoing plans involves more number of pumps and more pumping capacity compared to the URRP plan, though those data is still of interim output and subject to further update. It is expressed by BRR and PU Dinas that the drainage program would be implemented based on the outputs of the ongoing plans, though those outputs be scrutinized from technical and economic point of views.

4.6.4 **Additional Plan**

(1)**Electric Power Supply**

The power demand forecast is made under the following assumption and are as shown in Table 4.6.5.

- Average power demand per household : 900 – 1300 watt • Electric power demand for facilities
 - : 30% of domestic power demand

: 80% of total power demand

- Electric power demand for street lighting : 30% of domestic power demand
- Load Factor

Description	Electric Power Demand (MW)					
Description	2006	2006 2009				
1. Demand						
Domestic	53.3	66.0	93.7			
Public facility	16.6	19.8	28.1			
Street lighting	5.3	6.6	9.4			
Total	75.2	92.5	131.1			
2. Demand with Load factor	60.1	74.0	104.9			

Table 4.6.5 Future Electric Power Demand in BAC (2006 – 2015)

Source: Additional Study Team

The electric power supply in BAC is under jurisdiction of PLN. It is at moment difficult to say the source of power supply but PLN will appropriately implement the reinforcement of transmission and distribution lines in anticipation of growing demand.

(4) Tele-communication

Though cellar phone is spreading rapidly, there is still demand on land line telephone. Its demand is forecast based on the following assumptions and shown in Table 4.6.6.

٠	Residential, commercial,	
	Government, public services	: 17 service connections/100 people
•	Industry, tourism, warehouse	: 1 service connection/plot (0.5 ha)
•	Telephone kiosk	: 1 service connection/5000 people
٠	Public telephone	: 1 service connection/1000 people

Description	Service	Service Connection (SST)				
Description	2006	2009	2015			
1. Residential, commercial, services,						
government, public & social facilities	38,831	43.180	61.252			
2. Industry, tourism	340	435	654			
3. Telephone kiosk	41	51	72			
4. Public telephone	204	254	360			
Total	39,416	44,026	62,338			

Table 4.6.6 Communication Demand in BAC (2006 – 2015)

Source : Additional Study Team, 2006

There has been a very significant growth of cellular customers (such as Telkom Flexi users) in BAC after the disaster. In anticipation of continuously increasing demand, Telkom Flexi has a plan to install 21 Base Transceiver System (BTS) to meet increasing demand in BAC. Other cellular providers such as Telkomsel, Indosat, Excelcomindo, Mobil 8, etc also have plans to expand their service in the city.

4.6.5 Tentative Construction Time Schedule

The construction time schedule in the Final Report (1) of URRP is updated in this Additional Study based on assessment of urgency of the proposed projects in the light of the present situations and the modification of the plan of a couple of infrastructure development project. The updated construction time schedule is as shown in Figure 4.6.5.

Although the concept of LRT is studied, its implementation plan is not included. It is assumed that LRT would be realized after 2015.

4.6.6 Preliminary Cost Estimate

The preliminary cost estimate in the Final Report (1) of URRP is updated for a couple of the projects of which development plan has been modified after URRP. The conditions of the cost estimate are the same as those adopted in the said report. Table 4.6.7 summarizes the preliminary cost estimate of the rehabilitation and reconstruction works in BAC. The following points should however be noted:

- (1) The reconstruction of urban drainage system is being studied and this plan upon its completion, probably would be adopted for actual implementation. Since the construction cost is yet estimated, the same amount as stated in the above report is tentatively referred to.
- (2) The cost of health and education includes not only cost of the rehabilitation and reconstruction works but also cost for the periodical supply of materials and other requisites.

In the URRP Plan the total rehabilitation and reconstruction cost is estimated at Rp. 9,292 billion, while it is updated to Rp. 8,249 billion in the Additional Stud

ITEM	Short	t Term		Medium tern	,			Long	term		
ITEM	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
A. Housing						ł					
B. Electricity and Communication	,										
C. Water Supply	ļ	i		i	i				i	i	
C.1. Programs											
C1-1. Banda Aceh Water Supply master Plan 2007-2020 C1-2. PDAM Corporate Plan 2005-2009											
C1-3. Capacity Building Program		i			i						
C.2. Construction Works											
C2-1. PDAM Administrative Facilities C2-2. Rehabilitation of Lambaro (4351/s) waterTratment Plant											
C2-2: Rehabilitation of Water Didtribution System											
C2-4. Expansion of Lambaro Water Tretment Plant					: :						
D. Sanitation and Drainage											
D.1. Drainage	r					1					:
D1-1. Urgent Rehabilitation Works		1									
D1-2. Rehabilitaiton Works D1-3. Reconstruction Works											
D1-4. Dykes and Fooldwall		; ;									
D1-5. Flood canalplan in the south part of BAC D1-6. River normalization											
D.2. Sanitation											
D2-1. Recovery of existing septage Plant (IPLT)		-									
D2-2. Additional Septage Treatment Plant D2-3. Procurement of Vacuum cars											
D2-4. Sewerage Development					<u> </u>						<u> </u>
D.3. Solid Waste Management											
D3-1. Construction of new Landfill Site (TPA) D3-2. Packer and Dump Trucks					i						
E. Road and Transport E.1 Road											
E.1 Road E1-1. Rehabilitation of arterial roads and bridges		<u> </u>									
E1-2. Rehabilitation of Sub-arterial and other roads											
E1-3. Construction of coastal road											
E1-4. Extension of Jl. Sylah Kuala E1-5. Improvement of existing road for escape road											
E1-6. Construction of new arterial roads											
E.2 Traffic Management											
E2-1. Reconstruction of traffic management systems E2-2. Improvement of signals											
E.3 ROAD TRAFFIC FACILITIES											
E3-1. Reconstruction of bus terminal											
E3-2. Provisional of bus terminal, inspection center and truck terminal E.4 FERRY TERMINAL											
E4-1. Reconstruction of ferry terminal											
F. Health											
F.1. Improvement of environmental health		: :			: :		-			• {	: :
F.2. Basic health services / Referral services F.3. Infectious diseases prevention and control		!								!	
F.4. Preparation of medicine and medical supply		i	\square								
F.5. Dispatching health personnel and revitalization of education facilities		¦ ,			¦ ,					¦	<u>.</u>
F.6. Improving health Development policy and management											
F.7. Revitalization of drug and food security function F.8. Emergency Health and Medical Services		i			i i						i
G. Education											
G.1. School Building, Classroom, Furniture and Material G1-1. Rehabilitation of damaged schools											
G1-2. Providing emergency school classrooms											
G1-3. Providing school furniture and materials		r {									
G1-4. Reconstruction of schools											
G.2 Employment of Teacher											
G2-1. Recruiting temporary teachers											
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G.2.1. Recuting permanent liachers G.3.2. Exotuing permanent liachers G.3.2. Exotuing permanent liachers G.3.2. Exotiding schlaship, consuling traumatized students G.3.2. Providing schlaship, G.4.Capacity Building and Institutional Arrangement G.4.Capacity Building and Institutional Arrangement G.4.Toveloping school management G.4.Toveloping school management H. Disaster Preparedness H.1.Structural Measure H.1.Decade Breakwater H1.2. Souwall Freest H1.4. Todate Breakwater H1.2. Souwall Freest H1.4. Todate Breakwater H2.2. Escape Building H2.2. Escape Building H2.3. Escape Building H2.3. Escape Building H3.2. Sousall Freest H3.1. Solomenteet/Warning SreenMobile Phone System H3.1. Solomenteet/Warning SreenMobile Phone System H3.2. Sousall Watch F3.3.GPS System/Disaster Miligation Database H.4. Totake Inclusion and Disaster Awareness H4.1. Mass Media H4.2. CaS H4.3. Rabic Facilities											
C21. Recruiting temporary isachers C23. Recruiting temporary isachers C3. Scholarship C3.3 Evolding scholarship C3.2 Evolding scholarship C4.2 apachy Building and Institutional Arrangement C4.2 apachy Building and Institutional Arrangement C4.1 Devolging scholarship C4.2 apachy Boulding model and acutation C4.3 Devolging scholarship C4.4 apachy Boulding and Institutional Arrangement C4.4 Devolging scholarship C4.4 apachy Boulding and Institutional Arrangement C4.3 Devolging scholarship C4.4 apachy Boulding and Institutional Arrangement C4.4 Devolging scholarship C4.4 apachy Boulding and Institutional Arrangement C4.4 apachy Boulding and Institutional Arrangement C4.5 Devolging scholarship C4.4 apachy Boulding Institution C4.3 Devolging scholarship C4.4 apachy Boulding C4.4 apachy Boulding C4.4 apachy C4.4 apachy											

Schedule same as Original JICA URRP Study Report 2005
 Review of a schedule as Original JICA URRP Study Report
 Proposed of Additional study 2006

Figure 4.6.5 Implementation Schedule

Table 4.6.7 Preliminary Cost

ПЕМ	Total (Unit : Billion Rp.)	Remarks
A. Housing Sub Total	863.46	
B. Electricity and Communication		
Sub Total C. Water Supply	2,712.45	
C.1. Programs		
C1-1. Banda Aceh Water Supply master Plan 2007-2020 C1-2. PDAM Corporate Plan 2005-2009	3.14 0.33	
C1-3. Capacity Building Program	5.70	
C.2. Construction Works C2-1. PDAM Administrative Facilities	12.80	
C2-2. Rehabilitation of Lambaro (435l/s) waterTratment Plant	14.42	
C2-3. Rehabilitation Of Water Didtribution System C2-4. Expansion of Lambaro Water Tretment Plant	87.65	
Sub Total	21.67 145.71	
D. Sanitation and Drainage D.1. Drainage	1	
D1-1. Urgent Rehabilitation Works	130.28	for Rehabilitation and Reconstruction Works tentatively assumed to be same
D1-2. Rehabilitation Works D1-3. Reconstruction Works	49.40	as the URRP estimate, though the development plan might change.
D1-4. Dykes and Fooldwall	95.00	
D1-5. Flood canalplan in the south part of BAC D1-6. River normalization		Revised Revised
D.2. Sanitation	0.03	NGVISCU
D2-1. Recovery of existing septage Plant (IPLT)	7.98	
D2-2. Additional Septage Treatment Plant D2-3. Procurement of Vacuum cars	6.94 5.07	
D2-4. Sewerage Development D.3. Solid Waste Management	176.74	
D3-1. Construction of new Landfill Site (TPA)	206.52	
D3-2. Packer and Dump Trucks Sub Total		Revised
Sub Total E. Road and Transport	859.98	
E.1 Road		
E1-1. Rehabilitation of arterial roads and bridges E1-2. Rehabilitation of Sub-arterial and other roads	75.98	
E1-3. Construction of coastal road	247.00	
E1-4. Extension of Jl. Sylah Kuala E1-5. Improvement of existing road for escape road	43.87	
E1-6. Construction of new arterial roads	200.22	
E.2 Traffic Management E2-1. Reconstruction of traffic management systems	1.15	
E2-1. Reconstruction of trainic management systems E2-2. Improvement of signals	4.15 9.20	
E.3 ROAD TRAFFIC FACILITIES		
E3-1. Reconstruction of bus terminal E3-2. Provisional of bus terminal, inspection center and truck terminal	63.39 93.21	
E.4 FERRY TERMINAL		
E4-1. Reconstruction of ferry terminal	67.60	
E4-1. Reconstruction of ferry terminal Sub Total	67.60	
E4-1. Reconstruction of ferry terminal F. Health F.1. Improvement of environmental health		
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F.2. Basic health services / Referral services	1,367.58 58.40 255.00	
E4-1. Reconstruction of ferry terminal F. Health F.1. Improvement of environmental health	1,367.58 58.40 255.00 17.60	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F.2. Basic health services / Referral services F.3. Interclious diseases prevention and control F.4. Preparation of medicine and medical supply F.5. Dispating health presonnel and revitalization of education facilities	1,367.58 58.40 225.00 17.60 1.00 9.4.50	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F 2. Basic health services / Referral services F 3. Infectious diseases prevention and control F 4. Preparation of medicine aupply	1,367.58 58.40 255.00 17.60 0.00 94.50 1.9.90	
E4-1: Reconstruction of ferry terminal Sub Total F. Health F.1: Improvement of environmental health F.2: Basic health services / Referral services F.3: Infectious diseases prevention and control F.4: Preparation of medicine augply F.5: Dispatching health personnel and revitalization of education facilities F.6: Improving health Development policy and management F.7: Revitation of drug and food security function F.8: Emergency Health and Medical Services	1,367.58 58.40 225.00 17.60 1.00 94.50 26.00 25.40	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F.2. Basic health services / Referral services F.3. Intelicutes diseases prevention and control F.4. Preparation of medicine and medical supply F.5. Dispatching health Devision and revitalization of education facilities F.6. Improving health Devisionment policy and management F.7. Revitalization of drug and food security function F.8. Emergency Health and Medical Services Sub Total	1,367.58 58.40 255.00 17.60 94.50 1.00 94.50 19.90 26.00	
E4-1: Reconstruction of ferry terminal Sub Total F. Health F.1: Improvement of environmental health F.2: Basic health services / Referral services F.3: Infectious diseases prevention and control F.4: Preparation of medicine augply F.5: Dispatching health personnel and revitalization of education facilities F.6: Improving health Development policy and management F.7: Revitation of drug and food security function F.8: Emergency Health and Medical Services	1,367.58 58.40 225.00 17.60 1.00 94.50 26.00 25.40	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F.2. Basic health services / Referral services F.3. Indecloues disasses prevention and control F.4. Preparation of medic.ine and medical supply F.5. Dispatching health Development policy and management F.7. Revitalization of drug and food security function F.8. Emergency Health and Medical Services G. Education G.1. School Building, Classroom, Furniture and Material G.1. Rebubilitation of damaged schools	1,367.58 1,367.58 1,367.59 1,7.60 1,00 94.50 19.90 26.00 25.00 275.00 497.80 400.00	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F.1. Improvement of environmental health F.2. Basic health services / Referral services F.3. Intelicuous diseases prevention and control F.4. Preparation of medicine and medical supply F.5. Dispatching health Device/permet policy and management F.7. Revitalization of drug and food security function F.8. Emergency Health and Medical Services G.1. School Building. Classroom, Furniture and Material G.1. School Building. Classroom, Furniture and Material G.1. School Building. Classroom, Furniture and Material G.1. Providing school artifuture and medicals	1,367.58 1,367.58 1,367.58 1,367.59 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,360 1,367.58 1,	
E4-1. Reconstruction of ferry terminal Sub Total F. Health F. 1. Improvement of environmental health F. 2. Basic health services / Referral services F. 3. Infectious diseases prevention and control F. 4. Preparation of medicine and medical supply F. 5. Dispatching health Development policy and management F. 7. Revitalization of drug and food security function F. 8. Emergency Health Advector Supply G. Education G. 1. School Building. Classroom, Furniture and Material G. 1.4. Providing emergency school classrooms G. 1.3. Providing emergency school schools G. 4. Providing emergency school schools G. 1.4. Providing entergency school schools G. 1.4. Providing entergency school schools G. 1.4. Providing entergency school schools	1,367.58 58.40 225.00 17.66 94.50 19.90 26.00 25.40 497.80 440.00 61.00	
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E4-1. Reconstruction of forry terminal Sub Total F. Health F. 1. Improvement of environmental health F. 2. Basic health services / Referal services F. 3. Infectious diseases prevention and control F. 4. Preparation of medicine and medical supply F. 5. Dispatching health Development policy and management F. 7. Revitalization of drug and code security function F. 8. Emergency Health And Medical Services Sub Total G. Education G. 1. School Building. Classroom, Furniture and Material G. 1. Revitabiliation of durg and engl schools G. 1.2. Providing entropersy school classrooms G. 1.3. Providing schools G. 2.1. Recurling lemanter teaches G. 2.1. Recurling lemanter G. 3. Schools G. 3. Schools G. 3. Providing schools G. 3. Schools G. 3. Providing schools G. 3. Providing schools G. 3. Providing schools G. 3. Schools G. 3. Providing sc	1,367.58 58.40 225.00 17.66 100 94.50 26.00 25.40 497.80 400.00 61.00 22.00 26.00 26.00 25.40 497.80 40.00 61.00 22.00 26.00 61.00 26.00 26.00 45.00 14.00 45.00 14.00	
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CHAPTER 5 PLANNING ON THREE RECONSTRUCTION MODELS

5.1. SELECTION OF MODEL AREAS

At the first it was necessary to select three (3) areas to be suitable for reconstruction model development. The selection was made on the basis of the following criteria:

- (1) Is there a serious need in reconstruction and development?
- (2) Is conceivable reconstruction and development feasible?
- (3) Is there no social, political and environmental issues/problems in the area in question?
- (4) Is the conceivable reconstruction and development useful and adaptable to other parts of the city?

As a result of the assessment of a number of candidate sites and consultation to BAC government and BRR, Ulee Lheue, Peunayong and Lueng Bata areas have been selected finally for reconstruction model areas. Their locations are as shown in Figure 5.1.1.



Source: BAC Aerial Photography

Figure 5.1.1 Location of 3 Reconstruction Model Areas

5.2 ULEE LHEUE MODEL AREA

5.2.1 General Condition

(1) Location and topography

The proposed Ulee Lheue area is located within Meuraxa District and encompasses four (4) villages such as Ulee Lheue, Deah Glumpang, Deah Baro, and Alue Deah Tengoh and covers the area of 314 ha. The area is facing to the Strait of Malacca, and is one of the hardest hit areas by the 2004 disaster. Figures 5.2.1 and 5.2.2 show the aerial views of the area before and after the 2004 disaster respectively.



Source: BAC Aerial Photography Figure 5.2.1 Aerial View of Ulee Lheue Area before Disaster



Source: BAC Aerial Photography

Figure 5.2.2 Aerial View of Ulee Lheue Area after Disaster

As seen in the above figures, the area is characterized by very flat topography with elevation 0-3 m above mean sea level. There is a small island where a ferry terminal was under construction as seen in Figure 5.2.1at the time of disaster. After the disaster, majority of land area of the island was submerged.

(2) Land Use

There is no detailed land use data available for the area. From the aerial photograph, it is estimated that majority of land is shared by residential area and a number of fishponds before the disaster. After the disaster and subsequent clearing activities, the area is almost flattened and most of fishpond area is inundated. Mass Grave that bury around 15,000 tsunami victims was recently completed in this area.

- (3) Socio-economic Condition
 - (a) Population

Tables 5.2.1 and 5.2.2 describe the present and projected population of Ulee Lheue Model Area respectively, according to information from Meuraxa District & Head of Community by January, 2006.

No	Village	Pre-tsunami population		Post-tsunami population		Surviv	Returnee	
		Person	House hold	Person	House- hold	Person	House- hold	Household
1	Ulee Lheue	4,154	839	784	157	18.9%	67.93%	72
2	Deah Glumpang	1,172	294	332	67	28.3%	29.18%	120
3	Deah Baro	1,010	256	202	40	20.0%	67.19%	70
4	Alue Deah Tengoh	1,492	349	201	40	13.5%	59.31%	175
	Total	7,828	1,738	1,519	304			

Table 5.2.1 Pre-and Post Disaster Population in Ulee Lheue Model Area

Source: Meuraxa District & Head of Community, January 2006

 Table 5.2.2
 Projected Population in Ulee Lheue Model Area

Name of	Projected Population							
Villages	2005	2006	2007	2008	2009	2015		
Ulee Lheue	784	787	790	793	796	1,129		
Deah Glumpang	332	330	328	326	325	461		
Deah Baro	202	202	203	203	203	288		
Alue Deah Tengoh	219	220	220	220	221	313		
Total	1,537	1,539	1,541	1,542	1,545	2,191		

Source: The Additional Study Team

As seen in the above the population was reduced to almost 30 % after the disaster and even the survivors are now dislocated.

(b) Economic activity

Before the disaster majority of population is supposed to be relied on fishery, fish cultivation and their related activities for their livelihood, though the area is not far from the commercial center in BAC. But level of income is estimated to be very low as explained in Chapter 2 of this report. The 2004 disaster caused serious impact on livelihood of the people. Fishponds, fishing boats and fish market were all washed away and/or destroyed. It is a matter of significant to provide the returnee with houses and adequate support to sustain their livelihood.

5.2.2 Rehabilitation Program and Ongoing Works

The rehabilitation works are being executed energetically by the government and under assistance and help of donors and NGOs. Table 5.2.3 summarizes the rehabilitation works by sector and executing bodies involved for each of four villages.

No	Name of Villages	Executing Bodies						
No	Name of Villages	Village Planning	Land Tenure	Housing	Infrastructure & Utilities	Public Facilities	Economic Sector	
1	ULEE LHEUE1,129 persons526 households	UPLINK	BPN	UPLINK	• UPLINK • KUWAIT	UPLINK	UPLINK	
2	DEAH GLUMPANG • 370 persons • 174 household	UN- HABITAT	BPN	• OXFAM • WVI • UN HABITAT	 P2KP UN- HABITAT CARE WVI KUWAIT PU 	• WVI	• NOR- WEGIA • ELSAK	
3	DEAH BARO312 persons172 household	UN- HABITAT	BPN	• OXFAM • YBI	• P2KP • OXFAM	• P2KP	• P2KP • ELSAK	
4	ALUE DEAH TENGOH • 375 persons • 207 household		BPN	• OXFAM • YBI	• CARE • WVI • OXFAM • P2KP	• P2KP	• OXFAM • IRD • BPMD • ELSAK	

Source: Meuraxa District & Head of Community, January 2006

There are a number of rehabilitation works in progress as of February 2006 as summarized in Table 5.2.4.

No	Programs	Funding	Executor	Status
Ι	Housing Reconstruction	NGO's, donors, P2KP	NGO's, donors P2KP, Community	In progress
II	Road expansion and elevating			
	 Rama Setia Street 	BRR	City Government	In progress
	Iskandar Muda StreetPelabuhan Ulee Lheue Street	ADB 2005	NAD Province, BAC	Land acquisition is in process
	Pelabuhan Ulee Lheue Street	UNDP 2005	BAC	In progress
III	Ulee Lheue Harbor and Supporting Facilities Rehabilitation	Australia	BAC	In progress
IV	Dike Development			
	 Sea wall/Breakwater 	BRR	BRR and BAC	Partly in progress
	• Water tide dike	BRR	BRR and BAC	In progress
V	Redevelop Medan-Banda Aceh railway	France Government (SCNF)	Indonesia -France	Commitment of Pre Feasibility Study
VI	Mass Grave Development	UNDP, Islamic Relief	Islamic Relief	Physical execution in process
VII	Fish Auction Center Development	Norway, BRR	Norway, BRR	In progress
VIII	Planning and Reconstruction Program in four villages	NGO's, Donors, BRR	NGO's, Donors, BRR	Partly in progress
IX	Rehabilitation of Fishpond and others economic Development	NGO's, Donors	NGO's, Donors	In progress
Х	Water supply	Kuwait, Japan	Kuwait, JICS	In progress

Table 5.2.4 Status of Rehabilitation Program (As of February 2006)

Source: The Additional Study Team

5.2.3 Development Need and Constraint

Since the proposed area has been devastated completely, every infrastructure, housing, social and community facilities are required to be re-built. Especially construction of houses should be implemented at first track to allow the dislocated families back to their original land as earlier as possible. In addition it is important to install appropriate disaster forecasting and warning system and construct well organized evacuation roads to minimize effect of the potential disaster in future. Further it is also important to furnish the inhabitants adequate facilities to sustain their livelihood.

Construction of houses has been in progress expediently by the government and NGOs, but it is unclear when the demand could be met. There is no village map in one of four villages in the area concerned. For construction of roads and bridges, there would be no land problem, subject to further investigation.

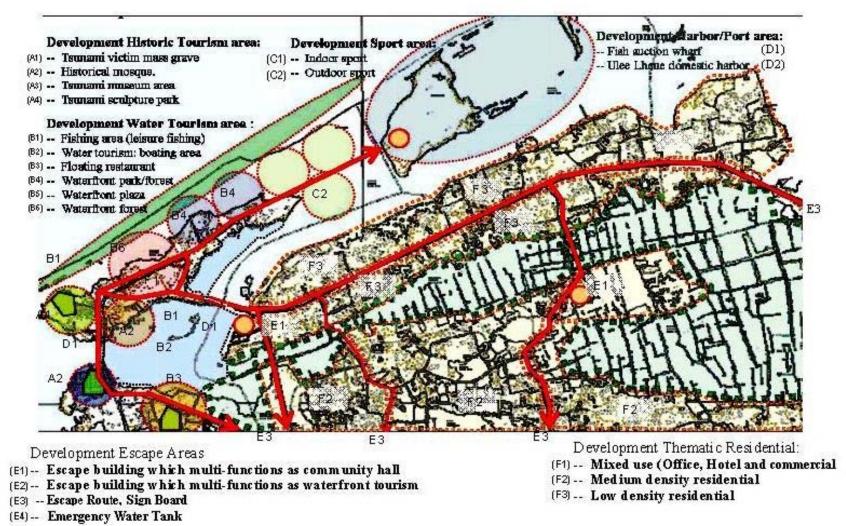
5.2.4 Preliminary Development Plan and Cost Estimate

(1) Preliminary Development Plan

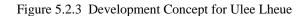
In principle Ulee Lheue area is proposed to be re-developed with a concept of beach front area with disaster preparedness, green area concept and appropriate facilities to sustain the in habitats including tourism facilities. This area will therefore have a mixed function as noted below:

- (a) Historic Tourism Theme: (i) tsunami victim mass grave; (ii) historical mosque; (iii) tsunami museum area; (iv) tsunami sculpture park.
- (b) Water Tourism Theme: (i) fishing area /leisure fishing; (ii) water tourism area
- (c) Residential: (i) mix use of residential and commercial; (ii) medium high rise (Hotel) residential.
- (d) Waterfront Green Theme: (i) waterfront park/forest; (ii) waterfront plaza; (iii)
- (e) Harbor: (i) fish market; (ii) domestic harbor.
- (f) Escape Areas: (i) community hall with disaster warning facilities, (ii) community road (evacuation road)

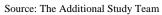
Figure 5.2.3 shows a reconstruction concept. On a basis of this concept, a preliminary reconstruction development plan is deliberated as given in Figure 5.2.4. Further as a part of disaster mitigation plan, a detailed plan of community road which will be a part of evacuation roads is prepared as shown in Figure 5.2.5.



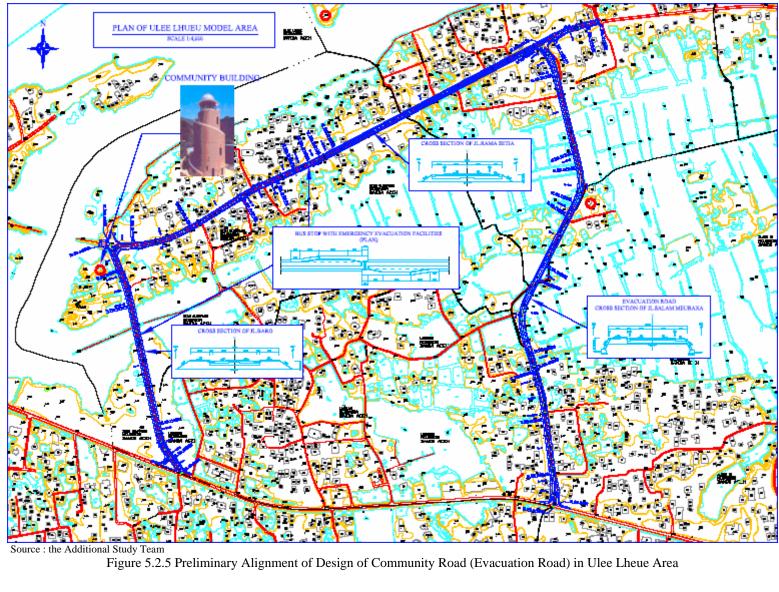
Source: The Additional Study Team











(2) Outlines of Reconstruction Works

The proposed development plan would include the following construction works: As of February 2006 some works have already been in place, and therefore it is necessary to catch up exactly the rehabilitation works in progress and/or planned already prior to actual implementation.

- (a) Houses for affected peoples
- (b) Infrastructure such as (i) seawall/break water, (ii) water tide dike, (iii) water and power supply, (iv) community roads, (v) storm water drainage
- (c) Public and social facilities for district and village scale
- (d) Disaster mitigation facilities such as (i) community roads (escape roads), (ii) community hall (escape building) with warning system
- (e) Formation of waterfront area such as (i) historic tourism area, (ii) water tourism area,
 (iii) thematic residential, (iv) waterfront green area, (v) harbor area
- (f) Production facilities such as (i) fish pond, (ii) fish market
- (3) Cost estimate

The construction cost for the proposed development is roughly estimated as given in Table 5.2.5.

No	Programs	Volume	Cost Estimation (Rp. Billion)
Ι	Housing	90 units	4.50
II	Infrastructure and Utilities:		
	• Seawall	2,370 m	4.22
	• Water tide dike	5,852 m	35.11
	Roads	7,205 m	23.15
	• Drainage	13,304 m	19.29
	Bridges	226 m	24.03
III	Public and Social Facilities	3,500 m ²	4.31
IV	Community Roads	4,020 m	24.00
V	community Hall	3 units	12.48
VI	Waterfront Area	6.28 million m ³	20.00
	Total		191.09

 Table 5.2.5
 Indicative Cost Estimate and Construction Period

Source: The Additional Study Team

The above cost is estimated under the following condition:

- (a) The development work will involve the ones to be realized and implemented by private sector. For such no cost is estimated
- (b) The estimated cost is only for the public work which would be realized by the government, donors, and NGOs
- (c) No cost of the ongoing works is taken into account

5.3. PEUNAYONG MODEL AREA

5.3.1 General Condition

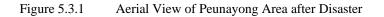
(1) Location and topography

The proposed Peunayong area is located in the center of BAC and occupies part of the Kuta Alam District, 48.6 ha in a gross area. The area is characterized by very flat topography and its elevation is in a range of 2 to 4m.

It is about 7 km away from the shoreline but was also hardly hit by the 2004 disaster. Unlike the Ulee Lheue area, there might be no serious geographic change in this area. Figure 5.3.1 presents the aerial view of the area after the 2004 disaster.



Source: BAC Aerial Photography (before and after tsunami



(2) Land use

The Peunayong area has been built up mainly for commercial purpose. It faces with the Aceh River on its east and includes a military complex at the southern corner of the area, a small pier for fishing boats and a fish market, all facing to the Aceh River. The proposed area is the old town of BAC.

Owing to the powerful earthquake and following tsunami, a number of houses were collapsed and/or seriously damaged. According to the report, approximately 80 % of the houses, 20 % of retail shops and 50 % of the social and government offices were suffered from damages of various degrees.

- (3) Socio-economic condition
 - (a) Population

According to Kuta Alam District, the pre- and post- disaster population are 4,382 and 2,858 respectively. The figures indicate that approximately 30 % of the inhabitants were perished by the disaster.

Population during the planning horizon was forecast as given in Table 5.3.1.

37/11	Projected Population								
Village	2005	2006	2007	2008	2009	2015			
Peunayong	2,858	2,872	2,887	2,903	2,919	4,141			

Table 5.3.1 Projected Population for Peunayong Model Area

Source: The Additional Study team

(b) Economic activity

Wholesale and retail sales of various kinds are the predominant economic activity, followed by fish trade and its related activity.

Because of damages in fishing piers and market, trade volume has been reduced, resulting in causing economic impact on many people, especially vulnerable people.

5.3.2 Rehabilitation Program and Ongoing Works

As the same as the Ulee Lheue area, various rehabilitation programs have been placed and implemented by the government, donors and NGOs. Such programs are as summarized in Table 5.3.2.

No	Programs	Funding	Executor	Status
Ι	Housing Reconstruction	NGO's, BRR, P2KP	NGO's, BRR, P2KP & community	Partly in progress
II	Road rehabilitation	BRR	BAC	In progress
III	Drainage rehabilitation	China, BRR	BAC	In progress
IV	Solid waste rehabilitation	BRR	BAC	In progress
V	Water supply rehabilitation	BRR, PDAM, Japan	PDAM JICS	In progress
VI	Utilities Network Rehabilitation	BRR, PLN, TELKOM	PLN, TELKOM	In progress
VII	Traditional Market	Japan, USAID	BAC	In progress
	Fishery Pier/Port Rehabilitation	CHF	BAC	In progress
	Fish Auction Rehabilitation	CHF	BAC	In progress
	Water tide Reconstruction	BRR	BAC	In progress

 Table 5.3.2
 Sector Program and Executing Body

Source: The Additional Study team

5.3.3 Development Need and Constraint

In principle, need of rehabilitation and reconstruction is common with the Ulee Lheue area. There is however a couple of issues specific in this area. That is need in provision of operating capital, tools and equipment for retail business and fishing related people. Construction of houses and rehabilitation of fishing peirs and market are matter of urgent to sustain the livelihood of the vulnerable people.

The area shows of fully built-up state and therefore land resources appear to be constraint for construction of facilities necessary for disaster mitigation and other new infrastructure. It would be necessary to provide a special program such as micro financing scheme to support the people who are in need of financial support in order to make their business more vital.

5.3.4 Preliminary Development Plan and Cost Estimate

(1) Preliminary development plan

In compliance to RTRW and structure plan of URRP, it is intended to maintain the present urban function of the area, being commercial center within BAC. This model area is proposed to be revitalized with the following themes:

- (1) Riverfront area
- (2) China town area (old town)
- (3) Military complex (existing)
- (4) City park (to be used as emergency relief/evacuation area)
- (5) Business district (hotel, office, retail and traditional commercial area)
- (6) Residential area (combined with shop)

Given the above development themes, a development concept is draw down as shown in Figure 5.3.2, and then a preliminary development plan is elaborated as given in Figure 5.3.3. Also a detailed plan of evacuation road system is prepared to facilitate the BAC government for its prompt implementation as shown in Figure 5.3.4, subject to further review and study prior to implementation in due consideration of the latest circumstances.

(2) Outlines of reconstruction works

The preliminary development plan will include the following proposed reconstruction works:

- (a) Houses for affected peoples
- (b) Improvement of infrastructure such as road, pipe water supply, storm water drainage
- (b) Landscaping including city park, emergency supply facility, disaster warning system
- (c) Formation of riverfront

(3) Cost estimate

Cost for construction of various works has been roughly estimated as given in Table 5.3.3, under the same condition as those of the Ulee Lheue area.

No	Programs	Volume	Cost Estimation (Rp. billion)
Ι	Housing	39 units	1.95
II	Infrastructure and Utilities:		
	• Road	3,387 m	3.14
	Drainage	6,768 m	2.37
III	Public and Social Facilities	6,500 m ²	4.93
	Total		12.39

Table 5.3.3 Indicative Cost Estimate and Construction Period

Source: The Additional Study Team



Traditional Market Rehabilitation

- -- Fish Market
- -- Fishing port
- China Town Conservation: Л. Tengku Hasan Krueng Kalee
- -- Mixed Use (commercial-housing) old building
- -- Arcade
- -- Speciality Shops

Green Corridor Development :

- -- Jl. Panglima Polim
- -- J1. Sri Ratu Safiatuddin

Business District Development :

- -- Hotel
- -- Office
- -- Retail Market
- -- Restaurant
- -- Public & Social Facilities

Green Park/Plaza Development:

- -- Relief Center
- -- Festival market place
- -- Emergency facility

Military Complex Development:

- -- Military Function
- -- Escape Building
- -- Water Tank for emergency uses

Krueng Aceh Riverfront Development

- -- Green park
- -- Port for fishery and tourism
- -- Promenade (along the river)
- -- Building orientation to river

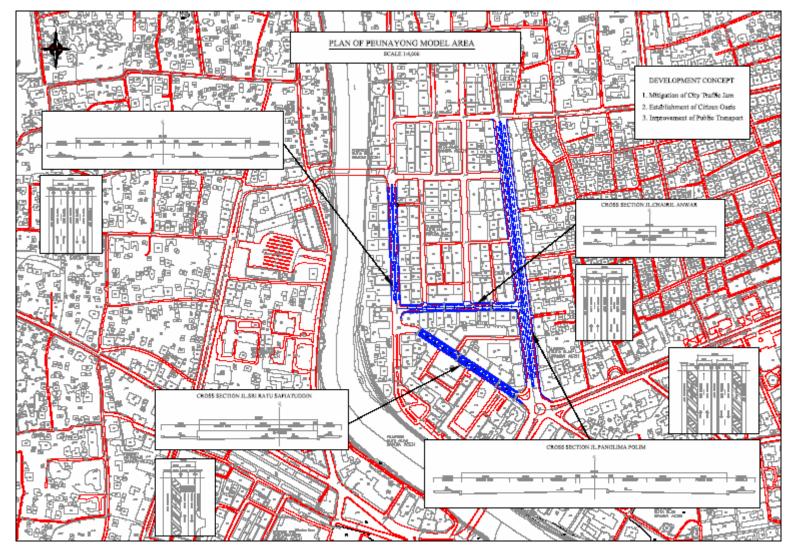
Source: The Additional Study Team

Figure 5.3.2 Development Concept for Puenyong Area





Figure 5.3.3 Preliminary Development Plan of Puenayong Area



Source : The Additional Study Team

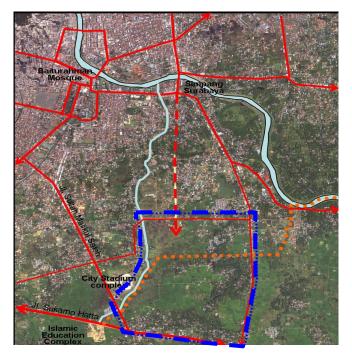
Figure 5.3.4 Preliminary Alignment Design of Evacuation Road in Peunayong Area

5.4 LUENG BATA MODEL AREA

5.4.1 General Condition

(1) Location

The aerial view of this model area is shown in Figure 5.4.1



Source: The Additional Study Team



The area lies across the southern border of BAC and consists of administrative areas of Penjeurat and Lamdom Villages in Lueng Bata District in BAC and part of Aceh Besar Regency. It covers the area of 338 ha and has slightly undulating hilly topography. There is no damage by the 2004 disaster in this area.

(2) Land use

The cultivation area is the predominant, though there are residential area, public and social facilities and sport facility.

Keeping pace with growth in population in BAC, there has been increasing demand in the area for residential plot development and presently such development is implemented without proper control and attention to the environment.

URRP has proposed to assign this area into residential area as a acceptable of increasing of population in BAC.

- (3) Socio-economic condition
 - (a) Population

According to the report of Lueng Bata District, population in Lamdom and Batoh villages were 1,625 and 3,769 respectively for the post-disaster situation, and it is reported that the

number of casualties was only 2 and 23 respectively for Lamdom and Batoh villages. But the population was suddenly increased in 2005 owing to influx of dislocated people from the affected areas.

Future population in the area is forecast at assumed average growth rate of 3 percent per annum as shown Table 5.4.1.

Village	Projected Population									
Vinage	2005	2006	2007	2008	2009	2015				
Lamdom	1,625	2,415	3,240	4,093	5,058	7,174				
Batoh	4,521	5,640	6,863	8,212	9,830	13,944				
Total	6,146	8,055	10,103	12,305	14,888	21,118				

Table 5.4.1 Projected Population of Lueng Bata Model Area

Source: The Additional Study Team

(b) Economic activity

The agriculture and its related activity are predominant in the economy of the area, though there is a number of retail shops to meet daily demands of the inhabitants.

5.4.2 Rehabilitation Program and Ongoing Works

The condition and status of rehabilitation program of Lueng Bata area is shown in Table 5.4.2.

Table 5.4.2 Sector Program and Executing Body

No	Programs	Funding	Executor	Progress
Ι	Housing scheme for dislocated people	Budha Tzuchi	NGO, community	Completed
II	Construction of new road and drainage New Road (Simpang Surabaya)	Government	Province Government	In progress
III	Road and Drainage Rehabilitation and Reconstruction	BRR, BAC	BAC	In progress
IV	Construction of Islamic Model Facility	Turkey	Turkey	In progress

Source: Additional Study Team

5.4.3 Development Need and Constraint

This contemplated area is quite different from the other two areas in terms of development need. The Ulee Lheue and Peunayong areas had been devastated by the 2004 disaster and therefore there are serious needs of the rehabilitation and reconstruction for many sectors, including support to the vulnerable and affected people. And in fact there have been established a number of programs in the Ulee Lheue and Peunayong Areas and many rehabilitation works have been completed and/or in progress as afore-mentioned. During the immediate relief stage the Lueng Bata area had acted as relief services area and thereafter a housing scheme was launched to receive the dislocated people who wish not to return to their original land and new comers.

The area is still blessed with rich vegetation and is supposed to be one of the sources of food supply.

Uncontrolled development of the area would result in causing serious natural and social environment impacts in future. It is not constraints but future development of the area be implemented under the proper control and regulation.

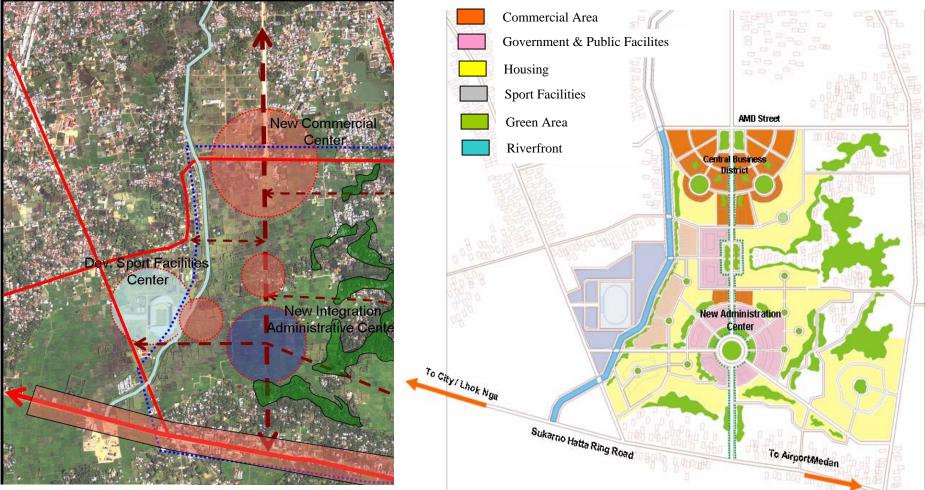
5.4.4 Preliminary Design and Cost Estimate

(1) Preliminary Development Plan

As aforementioned the Lueng Bata area will act as a receptacle of influx of population from BAC, probably resulting in causing burden on housing demand in future and land resources. In addition it is expected that some government offices would move there in future. The area is proposed to be developed with the following themes, subject to further study in due time:

- (a) Main green corridor
- (b) Forest and city park
- (c) Green belt
- (d) Low density residential area
- (e) Green central business district
- (f) Government office and public services

The above development concept is plotted on the aerial photograph as shown in Figure 5.4.2, which is then developed into the plan as shown in Figure 5.4.3.



Source: The Additional Study team

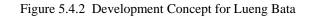


Figure 5.4.3 Preliminary Development Plan of Lueng Bata

(2) Outlines of Construction Works

The development of the Lueng Bata area would require construction of various new facilities as outlined here below:

- (a) Development of residential area
- (b) Construction of infrastructure such as roads, pipe water supply, electric power supply, storm water drainage, etc.
- (c) Formation of water front area
- (d) Landscaping including parks and greenbelt
- (e) Government office and other public facilities as required
- (f) Provision of disaster mitigation and emergency facilities such as water supply tank, disaster warning system
- (3) Cost Estimate

The construction cost for the proposed development is roughly estimated as given in Table 5.4.3, under the same conditions as those of the Ulee Lheue area.

No	Programs	Volume	Cost Estimation (Rp. billion)
Ι	Infrastructure and Utilities:		
	• Road	12,229 m	59.98
	Drainage	24,454 m	35.46
Π	Public and Social Facilities	42,000 m ²	51.74
	Total		147,18

 Table 5.4.3 Indicative Cost Estimate and Construction Period

Source: The Additional Study Team

CHAPTER 6 SHORT, MEDIUM AND LONG TERM PROGRAMS FOR REHABILITATION AND RECONSTRUCTION WORK IN BAC

The Final Report (1) of URRP provides the overall implementation plan for rehabilitation and reconstruction works in BAC. This plan actually categorizes all the rehabilitation and reconstruction work into (i) rehabilitation stage (2005-2006), (ii) reconstruction stage (2007-2009) and long term plan stage (2010-2015).

Under the Additional Study, the infrastructure development plan is updated and extended up to the target year 2015 as reported in Section 4.6 of this report. The construction cost is reviewed to absorb the modification and the latest situation, and implemented plan is also updated in the light of the prevailing situation and degree of urgency. And it is defined that the short term, medium and long term programs cover a two-year period from 2005 to 2006, a three-year period from 2007 to 2009 and a 5-year period from 2010 to 2015 respectively.

The annual fund requirement is then worked out on the basis of the preliminary cost estimate and tentative construction time schedule as presented in Table 6.1.

The fund requirement is estimated to be approximately Rp. 3,141billion during the short term program, Rp. 3,074 billion during the medium term program and Rp. 2,034 billion during the long term program.

Table 6.1 Annual Fund Requirement

	Short	Term		Medium term				Long	term		(011	t : Billion Rp
ITEM	2005	2006	2007	2008	2009	2010	2011	2012		2014	2015	Total
A. Housing Sub Total	124.90	223.49	223.49	145.79	145.79					. i		863.46
B. Electricity and Communication	325.65	325.65	427.05	427.05	427.05	130.00	130.00	130.00	130.00	130.00	130.00	2,712.45
Sub Total C. Water Supply	323.03	323.03	427.00	427.03	427.03	130.00	130.00	130.00	130.00	130.00	130.00	2,712.43
C.1. Programs C1-1. Banda Aceh Water Supply master Plan 2007-2020	i i	3.14	į	į			į		į	į		3.14
C1-2. PDAM Corporate Plan 2005-2009	0.33											0.33
C1-3. Capacity Building Program C.2. Construction Works	1.33	1.93	0.92	0.76	0.76		i		i			5.70
C2-1. PDAM Administrative Facilities	7.87	0.25	4.68							į		12.80
C2-2. Rehabilitation of Lambaro (4351/s) waterTratment Plant C2-3. Rehabilitation Of Water Didtribution System	4.15	10.27	1.04									14.42
C2-4. Expansion of Lambaro Water Tretment Plant	20.00	07.00	3.00	7.00	8.00	3.67	0.00	0.00	0.00	0.00	0.00	21.6
Sub Total D. Sanitation and Drainage	28.00	87.88	9.64 •	7.76	8.76	3.67	0.00	0.00	0.00	0.00	0.00	145.71
D.1. Drainage D1-1. Urgent Rehabilitation Works	32.57	65.14	32.57									130.28
D1-2. Rehabilitation Works	32.37	14.82	34.58						;			49.40
D1-3. Reconstruction Works D1-4. Dykes and Fooldwall	28.50	66.50	35.59	71.19	71.19							177.93
D1-5. Flood canalplan in the south part of BAC						0.02	0.01	0.02	0.01	0.00	0.03	0.0
D1-6. River normalization D.2. Sanitation				į		0.01	0.02	0.01				0.03
D2-1. Recovery of existing septage Plant (IPLT) D2-2. Additional Septage Treatment Plant	7.98	2.78	4.16									7.98
D2-3. Procurement of Vacuum cars	1	1.69	1.69	1.69			i		i			5.07
D2-4. Sewerage Development D.3. Solid Waste Management				6.74	15.00	20.00	20.00	25.00	30.00	30.00	30.00	176.74
D3-1. Construction of new Landfill Site (TPA)	1	103.26		103.26	0.00		0.00					206.5
D3-2. Packer and Dump Trucks Sub Total	69.05	0.99 255.18	108.59	0.99 183.87	0.99 87.18	20.03	0.99 21.02	25.03	30.01	30.00	30.03	3.9 859.9
E. Road and Transport												
E.1 Road E1-1. Rehabilitation of arterial roads and bridges	37.99	37.99		i						i		75.9
E1-2. Rehabilitation of Sub-arterial and other roads	271.61	271.61								;		543.2
E1-3. Construction of coastal road E1-4. Extension of JI. Syiah Kuala	- i			i		82.00	82.00	83.00	i	21.93	21.94	247.0
E1-5. Improvement of existing road for escape road			19.74									19.74
E1-6. Construction of new arterial roads E.2 Traffic Management									66.74	66.74	66.74	200.22
E2-1. Reconstruction of traffic management systems	i i			4.15								4.15
E2-2. Improvement of signals E.3 ROAD TRAFFIC FACILITIES	+					9.20						9.20
E3-1. Reconstruction of bus terminal			31.69	31.70								63.39
E3-2. Provisional of bus terminal, inspection center and truck terminal E.4 FERRY TERMINAL										46.61	46.60	93.2
E4-1. Reconstruction of ferry terminal			22.53	22.53	22.54							67.60
Sub Total	309.60	309.60	73.96	58.38	22.54	91.20	82.00	83.00	66.74	135.28	135.28	1,367.58
F. Health F.1. Improvement of environmental health	5.30	10.50	10.50	10.50	10.50	2.10	1.80	1.80	1.80	1.80	1.80	58.40
F.2. Basic health services / Referral services	117.70	118.20	3.60	2.20	2.20	2.10	1.80	1.80	1.80	1.80	1.80	255.00
F.3. Infectious diseases prevention and control F.4. Preparation of medicine and medical supply	2.80 0.40	6.80 0.60	4.00	0.70	0.50	0.49	0.48	0.47	0.46	0.45	0.45	17.60
F.5. Dispatching health personnel and revitalization of education facilities	6.60	9.50	10.40	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	94.50
F.6. Improving health Development policy and management F.7. Revitalization of drug and food security function	2.80 8.10	4.40 16.40	1.40 0.50	<u>1.40</u> 0.50	1.40 0.50	1.40	1.40	1.40	1.40	1.40	1.50	19.90
F.8. Emergency Health and Medical Services	6.10	8.40	6.10	0.50	0.50	0.90	0.90	0.50	0.50	0.50	0.50	25.40
Sub Total G. Education	149.80	174.80	36.50	24.30	24.10	15.49	14.88	14.47	14.46	14.45	14.55	497.80
G.1. School Building, Classroom, Furniture and Material	450.00	007.00		i			i		i	i		
G1-1. Rehabilitation of damaged schools G1-2. Providing emergency school classrooms	153.00 14.00	307.00 47.00										460.00
G1-3. Providing school furniture and materials G1-4. Reconstruction of schools	11.00	11.00	116.00	91.00	34.00	5.00	4.00	4.00	4.00	4.00	4.00	22.00 266.00
G.2 Employment of Teacher			110.00	91.00	34.00	3.00	4.00	4.00	4.00	4.00	4.00	
G2-1. Recruiting temporary leachers G2-1. Recruiting permanent leachers	25.00	8.00	2.00	2.00	2.00				į			33.0
G.3 Scholarship												
G3-1. Providing scholarship, consulting traumatized students G3-2. Providing scholarship	36.00	9.00	6.00	4.00	4.00							45.0 14.0
G.4 Capacity Building and Institutional Arrangement	1			i			ļ		ļ	i		0.0
G4-1. Developing leaching capacity G4-2. Improving non-formal education			10.00	4.00	3.00							17.0
G4-3. Developing school management			14.00	14.00	14.00		Ì		Ì	Ì		42.00
Sub Total H. Disaster Preparedness	239.00	382.00	149.00	116.00	58.00	5.00	4.00	4.00	4.00	4.00	4.00	969.0
H.1. Structural Measure												
H1-1. Detached Breakwater H1-2. Seawall	+ +		14.62	14.62	46.59 14.62	43.27 14.62	43.27 14.62					133.1
H1-3. Coastal Forest	2.97	2.97	2.97	2.97	2.97		i					14.8
H1-4. Tidal Gate H.2. Public Facility				i		5.90	9.00	11.00	12.00	12.00	12.00	61.9
H2-1. Escape Building H2-2. Escape Tower	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58		25.8
H2-3. Emergency Base and Open Space			0.62	18.06	5.16	5.16	5.16			1		0.6
H.3. Warning and Dissemination System H3-1. Seismometer/Warning Siren/Mobile Phone System	3.10	3.10	6.19	6.19	2.06							20.63
H3-1. Setsinomeen wanning sinah wooline Phone System H3-2. Tsunami Watch	3.10	3.10	0.17	0.19	3.10		!		!	!		3.1
F3-3. GPS System/Disaster Mitigation Database H.4. Public Education and Disaster Awareness						7.74	7.74					15.4
H4-1. Mass Media	0.93	0.93	0.93		0.93	0.93						6.5
H4-2. GIS H4-3. Public Facilities	2.10 0.62	2.10	2.10 0.62	2.10	2.10 0.62	2.10 0.62	2.11 2.38	3.00	5.00	5.00	5.87	14.7
F4-4. Monument including City Parks								16.00	16.00	16.00	16.23	64.2
H4-5. Drill for Escape Sub Total	0.21	0.21	0.21 43.74	0.21 48.27	0.21 80.94	0,21 82.92	0.21 88.00	0.20 32.78	35.58	35.58	34.10	1.4
	.2.30		13.74	13.21	55.74	UL.12	53.00	U2.70	00.00	00.00	o t. IU	0.00.7
J. Public Market, Government Building, Religious Building	52.26	59.80	45.50	45.50	45.50	26.00	26.00	26.00	~ ~ ~			326.56

Cost and Schedule same as Original JICA URRP Study Report 2005
 Review of a schedule, cost is same as Original JICA URRP Study Report
 Proposed of Additional study 2006

CHAPTER 7 CONSULTATION AND ASSISTANCE TO BAC GOVERNMENT

One of the important objectives of the Additional Study on URRP is to provide the Banda Aceh City government with consultation and assistance to expedite the process of the rehabilitation and reconstruction program which will include the structure plan with a long term vision. In compliance with this objective a team of the Additional Study has organized a meeting with the city government and the other government offices concerned over 6 times in the course of the study. The outlines of these meetings are summarized in Table 7.1.

	Date	Venue	Counterpart	Main Subjects
1	Oct 19, 2005	Bappeda,	BRR, PU Jakarta and Dinas,	≻ Presentation of Inception Report for
		Province	Mayor of BAC, Bappeda	Additional Study
			Province, Dinas Tata Kota, JICA	
			Study Team	
2	Nov. 9, 2005	Bappeda,	PU Jakarta and Dinas, Bappeda	≻ Spatial plan
		City	city, Dinas Tata Kota	> Integration of Additional Study with
				micro plan being prepared by PU Jakarat
3	Dec. 20, 2005	Governor's	BRR, JICA Indonesia, Embassy	≻ Presentation of progress of and interim
		Office	of Japan, JICS, Mayor of BAC,	results of the Additional Study
			City Bappeda, Dinas staff of city	
			govn., Other organizations	
4	Jan. 18, 2006	Mayor's	BRR, Bappeda City, PU dinas,	➢ BAC metropolitan concept
		Office	Dinas Tata Kota, Mayor of BAC	➢ BAC development concept and structure
				plan
				➤ Concept on 3 reconstruction models
5	Jan. 20, 2006	Bappeda	MOE, BRR, BAC Parliament,	➤ 3 reconstruction model planning
		Province	Bappeda Province, Mayor of	\succ Structure plan and development concept
			BAC, PU Dinas, Bappeda City,	
			Dinas Tata Kota	
6	Feb. 9, 2006	Bappeda	PU Jakarta and Dinas, Bappeda	> Outlines of draft final report
		City	City, Dinas tata Kota,	≻ Spatial plan in context of national
				standard
				≻ Legal aspect of BAC master plan being
				assisted by PU Jakarta
6	Feb. 16, 2006	Pendopo	BRR, DPR, DPRD, governor	➤ Tourism development of Ulee Lheue

 Table 7.1 Outlines of Meeting with the City Government