PART II

PLANS FOR REDEVELOPMENT

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CHAPTER 6 KALMUNAI TOWNSHIP REDEVELOPMENT PLAN

6.1 Rationale for Township Redevelopment Plan (KTRP)

The Kalmunai Township Redevelopment Plan has been used as a model for rehabilitation and development of the disaster affected township to be formulated through community participation. The effectiveness of community participation and its applicability to other regions are also to be evaluated at a later stage.

The reasons of selecting Kalmunai for the formulation of redevelopment plan are as follows:

1) Kalmunai municipality was the hardest tsunami-hit area in Sri Lanka, and is considered an important model in assisting in its rehabilitation and redevelopment. By doing so, the formulated redevelopment plan would be able to serve as the direct leverage for Kalmunai's rehabilitation/redevelopment activities.

2) Kalmunai has some of the typical features of Sri Lanka's Northern and Eastern region.

- Development status relatively backward due to the limited development supports from central government and near absence national/international donors

- Ethnic composition composed of Muslim and Tamil living in close proximity with chronic tension existing among them

It is considered that although challenging, by selecting Kalmunai, the formulated redevelopment plan would be able to exert the high applicability as an operational model to all socially and economically similar areas of the region.

The rationale adopted for formulating Kalmunai redevelopment plan is based on the hypothesis derived from earthquake experiences in Japan. As described earlier, some

of the most important lessons learned in Japan are applied as a working hypothesis, i.e. it is critically important to involve the disaster victims as community empowerment combined with government support. How this working hypothesis is actually applied into the project implementation is described in the following sections of this chapter.

6.2 Current Situation

6.2.1 Location and Area

Kalmunai municipality, which includes Kalmunai Tamil DS, Kalmunai Muslim DS and Sainthamaruthu DS, is situated 250 km east of Colombo in Ampara district on the eastern coast of Sri Lanka. It has approximately 67 square kilometers of land area and is extending over 10 km along the coast.

The target of this township redevelopment plan is Kalmunai municipality together with two neighboring DSs, Karaitivu DS and Nintavur DS. Total land area of the township is 150 square kilometer.

6.2.2 Population and Ethnicity

Kalmunai municipality is the most populated area in Ampara district and is also characterized by its highly dense population. Total population within Kalmunai municipality is more than 94,000 and most of the people live within 1.5 km range of the area between the seashore and national road A.4. The population density per square kilometer of the municipality is as high as 4,498 per square kilometer as shown in Table 6.2.1, whereas the national average is 299 people per square kilometer. Population densities of the four divisional secretariats in Kalmunai Township are highlighted in the following table.

Table 6.2.1 Population and Population Density in Ampara by DS (2001)

District	Divisional Secretariat (DS)	Population in 2001	Population Density per sq. km.
Ampara	Addalaichchenai	35,779	n/a
	Akkaraipattu	34,961	460
	Alayadiwembu	22,454	274
	Ampara	37,992	255
	Damana	34,754	64
	Dehiattakandiya	62,612	157
	Kalmunai	70,439	4498
	Sainthamaruthu	24,018	
	Karativu	16,210	1158
	Lahugala	7,587	9
	Mahaoya	18,023	27
	Navithanveli	17,330	347
	Samanthurai	51,142	
	Irakkamam	11,442	
	Ninthavur	24,673	822
	Padithyathalawa	15,648	39
	Pottuvil	28,404	143
	Thirukkovil	23,739	39
	Uhana	52,137	99
Total		589,341	

Source: Population in 2001, Planning Division, North East Provincial Council 2002

Another factor characterizing Kalmunai is its ethnic composition. Population in Ampara District is composed of Muslim (41.6 per cent), Sinhalese (39.3 per cent), Tamil (18.8 per cent) and others (0.3 per cent) as shown in Table 2.1.4 in Chapter 2. Muslims are predominant in Kalmunai and Nintavur DS, while Tamils are predominant in Karaitivu DS. Each group of ethnicity has formulated GNs and coexist next to each other forming a mosaic.

6.3 Objectives and Development Concept

6.3.1 Objectives and Development Concept

Through the efforts of Kalmunai people with cooperation and support of donors and NGOs, most of the urban function of Kalmunai Township has been recovered in a year since the tsunami tragedy. Redevelopment strategy is necessary in order to fully rehabilitate and to develop for future prosperity beyond the tsunami.

In due consideration of the present status the overall framework for the redevelopment of Kalmunai Township is planned as presented below.

Table 6.3.1 Framework of Restoration and Redevelopment of Kalmunai Township

Item	2004-2030
	04 05 06 07 08 09 10 11 12 13 14 15 16 17 ---------- 30
Tsunami	
A. Rehabilitation	
Evacuation relief, temporary house, income restoration, medical care, education restart, lifeline recovery, debris clearance	
B. Redevelopment	
Redevelopment plan formulation	
Urgent project	
Short-term priority project	
Mid-long term project	

Source: JICA Project Team

Under the framework of the rehabilitation and redevelopment of the Kalmunai Township, objectives of formulating the redevelopment plan are set as follows.

1) To provide perspectives for the future development of Kalmunai Township toward year of 2030

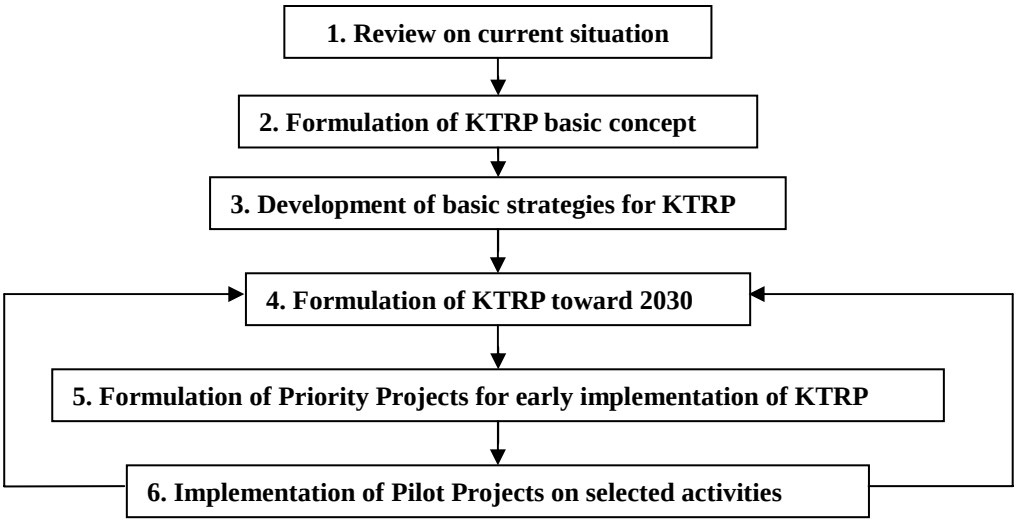
2) To identify priority projects to be implemented up to year 2010 and to prepare the implementation plan

3) To prepare the plan as a model for reconstruction and redevelopment of the urban area after disaster through the participation of stakeholders and community (participatory approach)

6.3.2 Process of Plan Formulation

The participatory approach has been taken from the stage of identification of local needs and planning priority projects to the implementation stage of the pilot projects. For this to materialize, three tiers of the working committees were formulated where several workshops and meetings were held with the related stakeholders and community representatives.

The following figure shows the work programmes for the formulation of Kalmunai Township Redevelopment Plan (KTRP).



Source: JICA Project Team

Figure 6.3.1 Work Flow of Kalmunai Township Redevelopment Plan (KTRP)

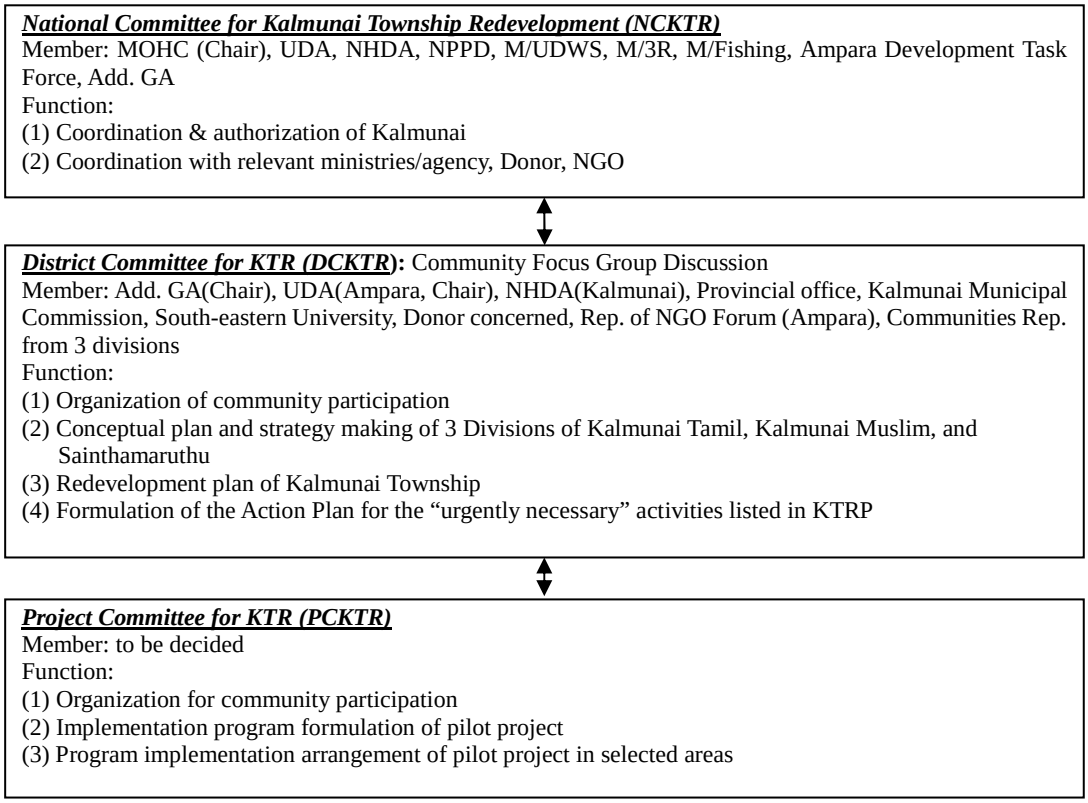
As shown in the above figure, the work flow is divided into six stages, namely 1) review on current situation, 2) formulation of KTRP basic concept, 3) development of basic strategies for KTRP, 4) formulation of KTRP, 5) formulation of priority projects for early implementation, and 6) implementation of pilot projects on selected activities. In these stages, various data/information, e.g. existing development plans of various sectors related to Kalmunai, and local demands and interest of the stakeholders through various workshops/meetings, were collected as inputs for planning.

Table 6.3.2 Work Programmes for Kalmunai Township Redevelopment Plan

Works	Scope	Role of Organization
1. Review on current situation	Information gathering and analyses of the existing data/information	Organizer: UDA Ampara
2. Formulation of KTRP basic concept	Conceptual development plan based on community agreement	Facilitator: South-eastern University
3. Development of basic strategies for KTRP	Strategize the conceptual development plan in the context of wider geographical and longer time scales	Planner: UDA, NHDA
4. Formulation of KTRP Plan	Making of Comprehensive Kalmunai Township Redevelopment Plan based on the basic concept and strategy	Collaboration: JICA Project Team
5. Formulation of priority project for early implementation in KTRP	Development of the priority project for the activities listed as "urgently necessary," in the KTRP	Organizer: UDA Ampara Facilitator: South-eastern University Planner: UDA, NHDA, CBO or similar organizations Collaboration: JICA Project Team
6. Implementation of pilot project on selected activities	Pilot project implementation of the selected activities included in the Priority Project	Implementation: CBO Planner: Project Committee for KTRP Collaboration: JICA Project Team

Source: JICA Project Team

In order to carry out above activities, the three-tier work organizations were set up in national and district levels, as shown in the following chart.



Source: JICA Project Team

Figure 6.3.2 Planning Organization for Kalmunai Township Redevelopment Plan

The following meetings and workshops were held to formulate the Kalmunai Township Redevelopment Plan.

1) National Committee for KTR (NCKTR): 2 times

2) District Committee for KTR (DCKTR): 4 times

3) Community Focus Group Discussions (FGDs): 1 time (once for each 3 DS)

After discussing basic policies and schedule in the NCKTR, meetings have been held in the DCKTR on local needs for the rehabilitation and redevelopment of Kalmunai Municipality, where all the related governmental organizations, representatives from Eastern University, NGOs and community people participated. The identified needs were further classified into urgent, short-term and long-term development.

The details of three meetings and workshops are shown in Table 6.3.3.

Table 6.3.3 Meetings and Workshops Carried Out

Activities	Date	Main Participants	Agenda/Outputs	
National Committee for Kalmunai Township Redevelopment (NCKTR)				
First NCKTR	May 25, 2005	Secretary from MOHC, Chairman of UDH, etc.	Discussion and confirmation of KTRP study contents (organization, schedule, scope, etc.)	
Second NCKTR	October 13, 2005	Minister, Secretary, relevant Directors from MOHC, AGA from UDA	Introduction of redevelopment concept and plan	
District Committee for KTR (DCKTR)				
First DCKTR	July 16, 2005	AGA (Ampara), DS (from three DSs), MOE (Ampara), MOF (Ampara), South Eastern University, UDA (Ampara), Representatives from Muslim society, hospitals, journalists	Explanation and discussion of the KTRP study contents (organization, schedule, scope, etc.) Case presentations and discussion of the Disaster Prevention/Redevelopment plan (Tokyo and Caracas (Venezuela))	
Second DCKTR	August 13, 2005	In addition to above; Secretary General of Kalmunai Disaster Management Council, representative of women's organization, RDA (Akkairapattu), NHDA, DPDHS	Presentation and discussion of; - Redevelopment Plans by 3 DS in Kalmunai Municipality area - Road Recovery Plan by RDA - Medical Facilities Redevelopment Plan by DPDHS	
Third DCKTR	September 3, 2005	AGA (Ampara), Commissioner of Municipal Council, DS (from three DSs), Secretary General of Kalmunai Disaster Management Council, Representative of Rotary Club, UDA, CEA, Fishery Dept., business community people	Presentation and discussion of; - Redevelopment plan of District Fishery Department - Redevelopment perspectives from business community, - Environmental aspects on redevelopment plan Redevelopment Planning Exercises in consideration of FGD Workshops results;	
Fourth DCKTR	September 17/18, 2005	Same as third DCKTR	Presentation of redevelopment plan conceived depended on the ideas of third DCKTR by JPT.	
Fifth DCKTR	October 22, 2005	Same as third DCKTR	Proposals of Priority project and pilot projects	
Community Focus Group Discussion (FGD) Workshops				
FGD Workshops held in 3 DS in Kalmunai Municipality	August 25/26, 2005	Representatives of various community sections from Kalmunai Muslim DS, Kalmunai Tamil DS, and Sainthamaruthu Ds	Participatory discussions/analyses of the present issues/constraints and future redevelopment prospective for various sectors/aspects. /note	

Source: JICA Project Team

6.3.3 Concept of KTRP

(1) Understanding on Disaster and Appropriate Disaster Management

1) Tsunami Damage in Kalmunai

The main features of the tsunami damages are summarized below.

- Approximately 80% of total damage occurred within 200m from the shoreline in Kalmunai Township. Refugees evacuated to relatives and friends' houses beyond 200m after the disaster and received assistance from their families to supplement the relief from the government.

Table 6.3.4 Number of Damaged Houses by Distance category from Shoreline (Kalmunai DS)

	within 100m	100m - 200m	Beyond 200m	Total
	Fully damaged	Fully damaged	Fully damaged	Fully damaged
Kalmunai Municipality (Muslim DS)	426	230	174	830
	51.3%	27.7%	21.0%	100.0%

Source: Kalmuı /1 Kalmunai (Muslim) DS office as of 8 April 2005

- The reason why the damage in the area beyond 200m was limited is that the tsunami did not reach the upstream area since rivers were small and an estuary was closed by a sand dune when the tsunami hit.

- No fire damage occurred because of the block-made housing structures.

- The high death toll was mainly caused by the lack of knowledge of tsunamis. People did not evacuate even when the coastal tide showed signs of a tsunami, and there was no evacuation system including warning system.

- Due to lack of an evacuation system, human lives were lost again in March 2005, when another Indonesian earthquake hit. A fatal traffic accident occurred while evacuating due to confusion on the narrow road of Kalmunai Township.

- Aid centres were not established after evacuation except for some religious facilities, and relief supports such as medical care, food/drink support, etc. were not provided sufficiently.

Characteristics of the tsunami damage in Kalmunai Township are compared with earthquake damages in Japan in the table below.

Table 6.3.5 Comparison of Tsunami Damages with Earthquake Damages in Japan

	Tsunami Damages in Kalmunai	Earthquake Damages in Japan
Damage Area	Tsunami damaged area is limited to certain distance from shoreline and remaining township was not damaged.	A large extent of area can be damaged in strong earthquake.
Damage	Some houses/structures were destroyed and many lives were lost due to strong ebb tidal stream	Large buildings/structures are destroyed. There are serious risks of fire damage in Japan.
Evacuation	Damage could have been minimal if the tsunami mechanism had been well-known, and if the warning and evacuation system had been developed.	Predictive warning and evacuation is difficult. Evacuation from damaged area, buildings, fire and effective rescue/relief are measures to minimize the damage.
Experience/knowledge	This tsunami is the first experience not only for people but also for the whole Sri Lankan society.	Knowledge and experience have accumulated in Japan.

Source: JICA Project Team

2) Appropriate Disaster Management in Kalmunai

On the basis of experience with tsunami and considering the topographical characteristics of Kalmunai, the following aspects are to be taken into consideration in the development of a disaster management plan in Kalmunai.

- Experience from the tsunami on December 26, 2004 is to be fully utilized for future disaster management.
- In Kalmunai, structural measures against high waves are practical considering geographical conditions along the coast.
- More important is non-structural measures such as disaster management awareness of the people and introduction of an appropriate evacuation system.
- Remembrance of the tragedy among people and society should be facilitated to maintain awareness.

(2) Development Concept of the KTRP

1) Basic Principles for KTRP

Basic principles for formulating the KTRP are as follows:

- The KTRP includes not only a rehabilitation plan after the tsunami, but also future urban development plans corresponding to the future socio-economic development. Preparation of an urban development plan with natural disaster resistance in its core is the basic concept of the KTRP.

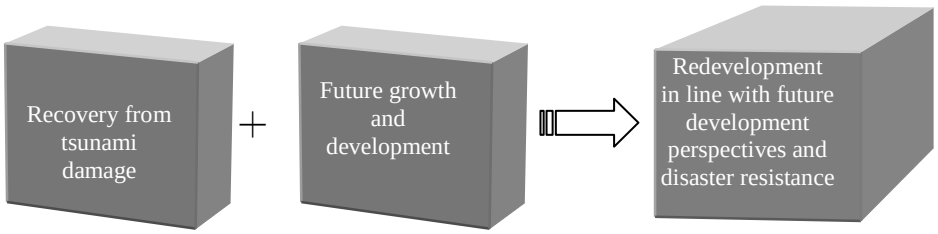


Figure 6.3.3 Principles for Kalmunai Township Redevelopment Plan

- The KTRP is compatible with previous plans such as UDA/NPPD/Ministry of Housing initiated and conducted "Eastern Provincial Physical Plan" and "Master Plan for Ampara District.
- The KTRP planning process is essentially community driven, technically adequate and environmentally sound. Particularly, involvement of the related stakeholders and community representatives are emphasized throughout the planning period.
- The existing ethnic divide in the extremely high population density is to be carefully taken into account for the KTRP.

2) Principles for Disaster Management

In order to create more resistance against tsunami and monsoon storms, Kalmunai Township with a length of 10 km and width of 1km should urgently develop the countermeasures. However, due to the long shoreline and steep seabed, construction of structural measures such as dyke and breakwater is impractical. An alternative measure of raising the beach road is not acceptable considering the adverse impact on fishing activities and the beautiful beach landscape as shown in Photo 6.2.1.

Photo 6.2.1 Landscape along the beach road in Kalmunai, spoiled by Remaining Debris

Instead, considering that damages by tsunami and monsoon high wave could be prevented or minimized by evacuation, implementing an efficient warning and guiding system, following non-structure countermeasures are proposed as part of a disaster management plan in Kalmunai Township.

a) An evacuation system for tsunami or monsoon high wave is to be introduced as part of the disaster management in Kalmunai Township. For this purpose,

development of an effective and sufficient warning and evacuation guidance system as well as enhancing awareness and training of people in the community are to be introduced.

b) The most effective measures are enhancement of the awareness of people in the community on tsunami disasters and introduction of regular evacuation training. Construction of a memorial park and annual remembrance ceremonies will be opportunities for raising awareness.

c) To supplement the above countermeasures, the following plans will support the disaster management plan in Kalmunai.

- In the 65 m width buffer zone along the shoreline, construct parks and green belts with coconut trees to reduce the impacts of tsunami and monsoon waves. Coconut and other vegetation in the buffer zone will be effective for the landscape beatification as well as local resources development.
- Improvement of the east-west internal roads connecting the beach and national road No. 4 is important for promoting the evacuation. However, land ownership issues are too complicated in Kalmunai to release land, and widening of internal roads will be the medium term target.[1]
- Establish evacuation centre (aid centre) in the park, open space, religious centres.

3) Restoration and Urban Development

Urban facility development and industrial promotion as well as livelihood improvement have been strongly requested by the community in addition to the disaster management. Disaster management and urban development are to be planned in parallel corresponding to the needs.

Principles for urban development and livelihood improvement are summarized below.

- In line with the expansion of urban framework, countermeasures and infrastructures such as planned new residential area development, public service facility development, infrastructure development, etc. shall be implemented to improve the urban function and to preserve the lagoon environment.
- Urban centre development such as parks, athletic amusement areas, tourist destinations, etc. will be the core project to furnish urban amenity in Kalmunai.
- Promotion of local industry to improve the livelihood is also important for the

[1] Land adjustment method for the redevelopment of unplanned urban area is difficult to apply in Kalmunai Township due to the people's strong attachment to land ownership. Acreage reduction of plot land and/or multiple floor housing is not likely to be applicable and long term solutions are necessary for the township development.

community. Rehabilitation and enhancement of the fishing industry and local industry using local resources are needed.

As presented below, restoration and urban function upgrading with strengthening of disaster management and livelihood improvement will be the main focus in the Kalmunai Township redevelopment.

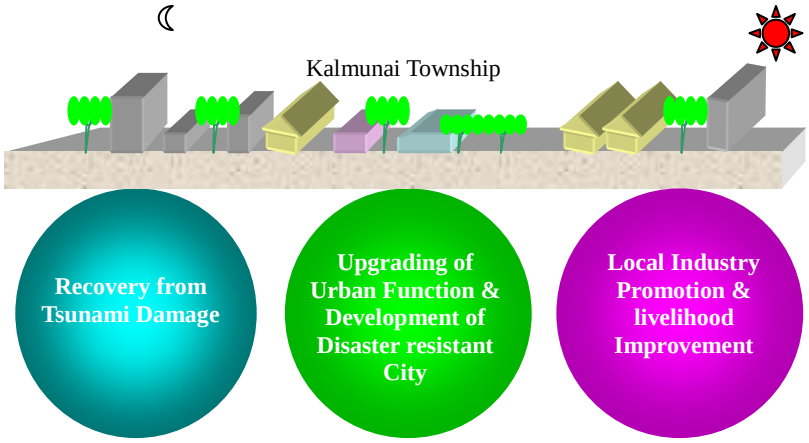


Figure 6.3.4 Concept of the Kalmunai Township Redevelopment Principles

6.4 Kalmunai Township Redevelopment with Target Year of 2030

6.4.1 Development Framework

(1) Projection of Population

The population of Kalmunai Township is estimated at 147,000 including 102,000 in Kalmunai Municipality and 45,000 in Ninthavur PS in 2005 as shown below. The future population of the Township is estimated to be 164,000 in 2010 and 252,000 in 2030 in accordance with the estimation of UDA's Eastern Province Physical Plan. This means that 17,000 will be added by 2010, and by 2030 increased population is expected to be around 105,000 compared to 2005.

Table 6.4.1 Future Population of Kalmunai Township

DS Division	2001	2005	2010	2020	2030
Kalmunai	70,439	76,000	85,000	112,000	131,000
Sainthamaruthu	24,018	26,000	29,000	38,000	45,000
Kalmunai Municipality total	94,457	102,000	114,000	150,000	176,000
Increase from 2005			**12,000**	**48,000**	**74,000**
Karativu	16,210	18,000	20,000	26,000	30,000
Ninthavur	24,673	27,000	30,000	39,000	46,000
Ninthavur PS total	40,883	45,000	50,000	65,000	76,000
Increase from 2005			**5,000**	**20,000**	**31,000**
Total	135,340	147,000	164,000	215,000	252,000
Increase from 2005			**17,000**	**68,000**	**105,000**
Annual increase rate		2.1%	2.2%	2.7%	1.6%

Source: (2001)--Population Census, Population Estimates (2005,2010,2020,2030) -- Easterm Province Physical Plan

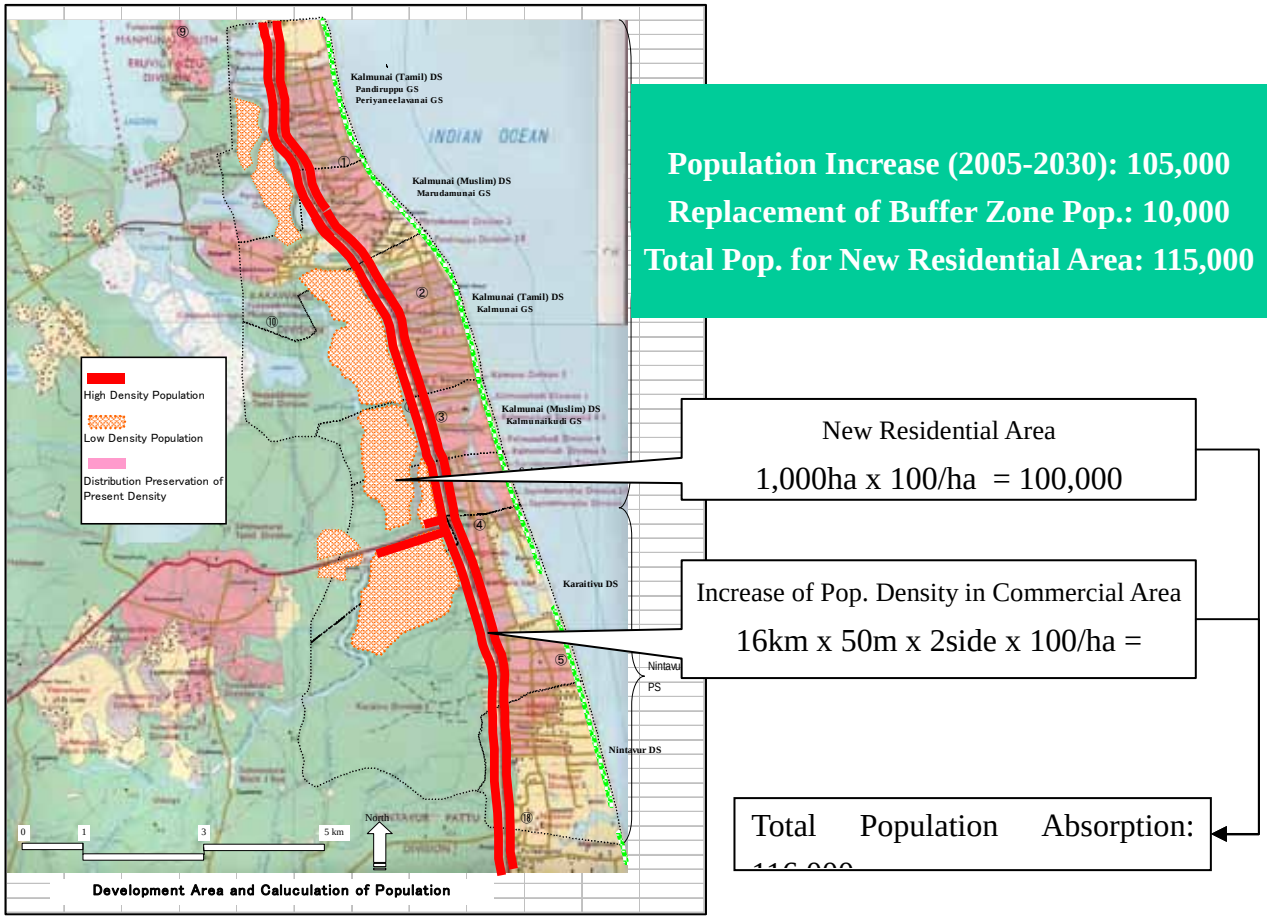
To accommodate the population increase, redevelopment for intensive land use of existing urban area along the main road and new development of township is undoubtedly necessary. As shown in Figure 6.4.1, the extent of approximately 1,000ha (2,500 acres) currently used for paddy field, lagoon, and barren land spread in the western part of the Route A4 is necessary for the new development of township.

Figure 6.4.2 shows the existing plans for Kalmunai Township expansion proposed by relevant organizations, in which the paddy fields and lagoons spread in the western part of Route A4 are the target of township expansion. These ideas have not been realized till now because the development cost inclusive of land acquisition and construction cost exceeds the expected benefit.

Considering the fact that the anticipated rapid population increase can not be accommodated within the existing Kalmunai Township, development of a new township is most likely to be taken up in near future.

The anticipated problem of reclamation of paddy field and lagoon which will cause the increase of flood occurrence is another reason of the delayed new township development.

The countermeasures of improving the drainage facility in Kalmunai urban area and strengthening of rain retention capacity in the lagoon should be a prerequisite for the start of the development of new township in Kalmunai.



Source: JICA Project Team

Figure 6.4.1 Projected Township Development in Kalmunai

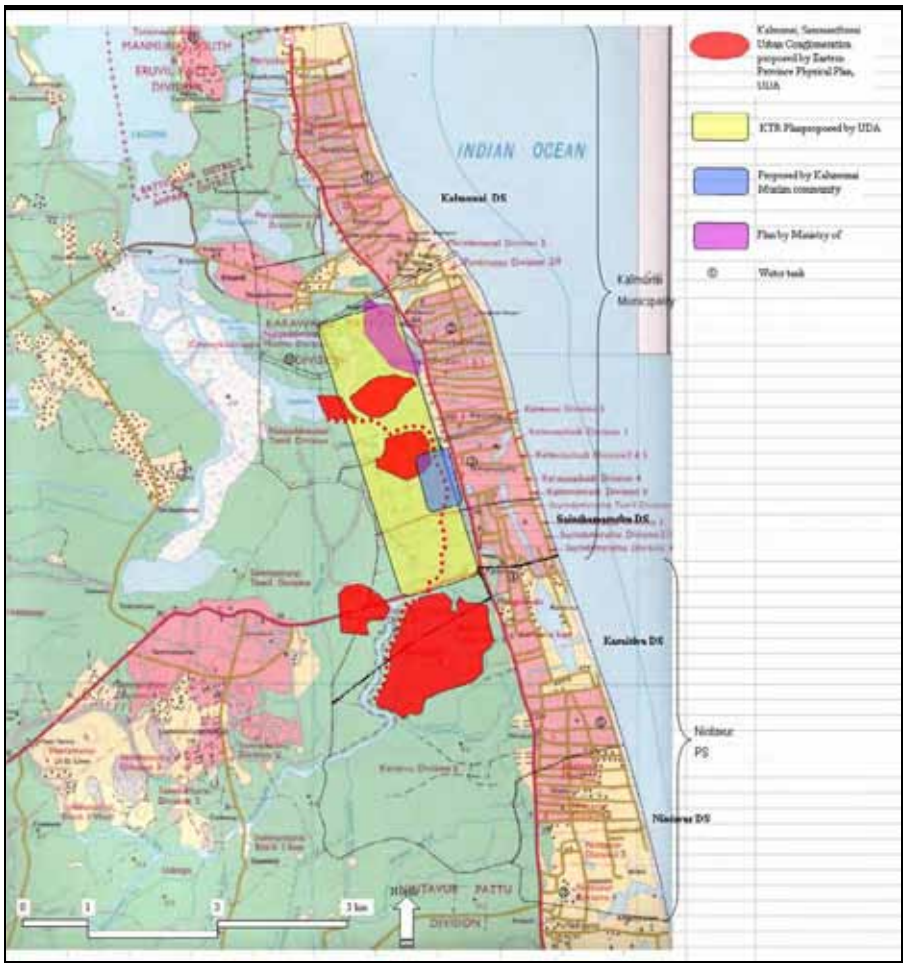


Figure 6.4.2 Target Land Proposed in Existing Plans for Kalmunai Township Expansion

(2) Land Use Plan

The land use plan of Kalmunai Township in 2030 with 250,000 populations was prepared on the basis of following assumptions as presented in Figure 6.4.3.

- In the existing urban area developed between Route A4 and sea coast, improvement of internal road network, development of evacuation aid centre and establishment of a buffer zone along shoreline will be implemented to strengthen the disaster resistance capacity of the township.
- For the purpose of developing the new amusement core in the township, rehabilitation of Thonas and development of a memorial park will be implemented.
- A new township with residential areas, new business zones, park and green space, etc. will be developed in the west of Route A4.
- The lagoons will be expanded for the enhancement of the flood retention capacity as well as the procurement of soil materials for land reclamation for new township. The expanded lagoons will contribute to fresh water fishing and new development of a water front park facility.
- A new industrial zone for small/medium processing industry will be developed at the expanded lagoon shore.
- A by-pass road of Route A4 will be necessary in case the traffic exceeds the road

capacity after 2020.

Source: JICA Project Team

Figure 6.4.3 Land Use Plan of Kalmunai Township (for the year of 2030)

(3) Identified Projects/Programmes

As mentioned earlier, the KTRP is planned to be formed basically under the concept of participatory approach. Through the District Committee and Community Focus Group

of the KTRP, various discussions were made and needs for the rehabilitation and redevelopment in the Kalmunai Township were identified. Based on the proposed schemes, implementing priority of the proposed improvement plans was also discussed among the stakeholders and community representatives, and schematically classified as presented in Figure 6.4.4.

The project/programme is categorized by (1)urgent project/programme necessary for urgent redevelopment/development, (2)priority redevelopment/development project/programme to be implemented within short-term period (approximately 5 years), (3)non-priority development project/programme expected to be implemented in short term, 4)other development project/programme expected to be implemented in mid/long term period.

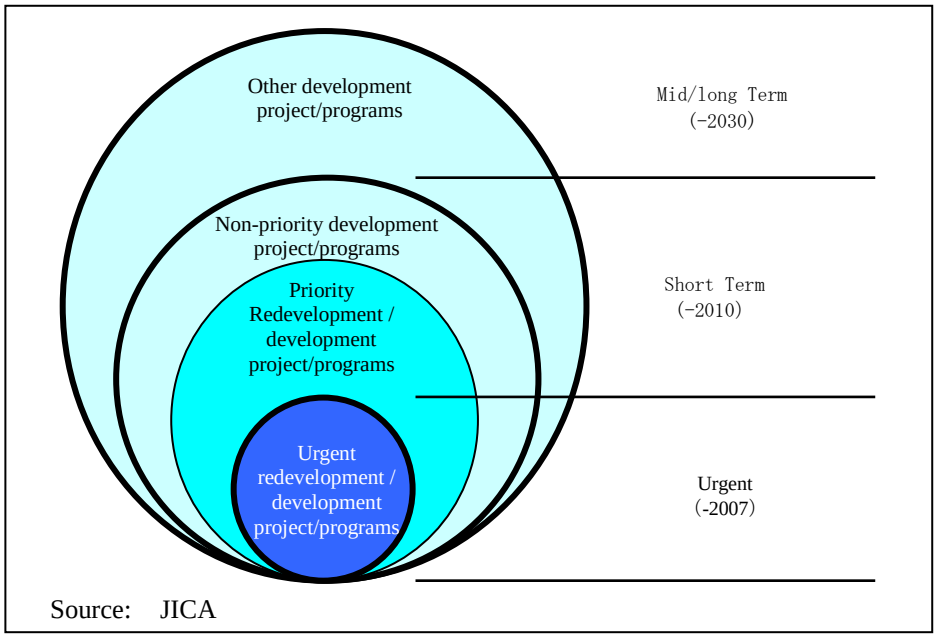


Figure 6.4.4 Schematic Image of Project/Programme Configuration

The project/programmes being already implemented by NGO and donors and the pilot projects planned to be conducted by JPT are categorized in the urgent project/programme.

Regarding the houses for resettlement of tsunami victims, around 4,000 houses are required in Kalmunai out of which only 1,000 houses are completed or under construction. The remaining some 3,000 houses are to be provided to the tsunami victims. Though commitment for construction of these houses has been made by international donors and NGOs, actual implementation is being delayed mainly due to the difficulty in land acquisition. To facilitate the construction, GOSL plans to acquire

around 90 acres of private land, currently used for paddy production, but, only 5 acres of the land has been purchased as of to the end of February 2006 and disputes related to the land acquisition stalls further progress.

Table 6.4.2 shows the summary of projects/programmes, and details of proposed project/programmes with priority evaluation and planned implementing organization are presented in Table 6.4.3.

Table 6.4.2 Summery of Proposed Projects/Programmes for Kalmunai Redevelopment

	nt redevelopment/ development project/programmes	ty redevelopment/ development project/programmes	lon-priority development project/programmes & Others development project/programmes (major items only)
Management	• **Evacuation plan (alarming/ evacuation system education/ training)** • *Establishment of coastal buffer zone*	• Evacuation plaza (aid centre after disaster) • Hospital contingency plan • Memorial park (memory of disaster for appropriate evacuation activity) • Improvement of drainage system	
od restoration	• **Restoration and promotion of local industry and livelihood restoration** • *Rehabilitation of fishing industry (gear storage, ice plant)*	• Enhancement of fishing industry (Community multi-purpose training centre)	• Promotion of fishing industry (fishing support facility development) • Promotion of local basis industry/development of industrial estate • Promotion of commercial and tourism industries
development/ public service enhancement	• *Resettlement houses for tsunami victims* • *Restoration of affected hospitals* • *Restoration of affected education facilities* • *Restoration of transportation facility (Route A4)*	• Housing development for population increase • Improvement of drainage system • Redevelopment of Thonas as the environment amusement city core • Improvement of medical care/education service • Utility improvement (water supply, sewage treatment, electricity supply) • Solid waste/debris disposal • Improvement of transportation facility (city road network, bus terminal)	• Housing development for population increase • Enhancement of medical care/education service • Improvement of public service (public service, culture centre, police, common market) • Development of park/green • Improvement of transportation facility (Development of public parking system)

Note: /1 Project/programmes shown in italic letter in urgent category are under implementation with the assistance of Japanese Non-project Grant Aid, NGO, and other donors.
/2 Project/programmes shown in bold letter are planned as the target for JPT pilot project.
Source: JICA Project Team

Table 6.4.3 Proposed Projects/Programmes for Kalmunai Township Redevelopment

Item		Effectiveness	Schedule /1			Priority evaluation /2	Implementing Organization
			U	S	M/L		
Disaster Mitigation and Management							
DM-1	Disaster Mitigation Training Knowledge Empowerment	high	■			P	GOSL
DM-2	Public Awareness System incl. Information Board, etc.	high	■			P	GOSL
DM-3	Plantation in the Coastal Buffer Zone	high	■	■		P	Municipality
DM-4	Tsunami Memorial Park / Museum development	high		■		P	Municipality
DM-5	Evacuation Plazas (Aid centre after disaster) development	high		■		P	Municipality
DM-6	Storm Water Drainage System Improvement(same as U-20)	high		■		P	RDA,RDD
Livelihood Restoration							
(Fishery Industry)							
E-1	Fisheries Anchorage redevelopment			■			MOFAR
E-2	Boat Gear Storage Improvement	high	■			P	MOFAR
E-3	Increasing the Number of Multi-day Boats			■			Private
E-4	Safe Landing for Day Boats/Multi-Day Boats (Slipway)			■			MOFAR
E-5	Redevelopment of Transport Support Facility	high	■	■		P	MOFAR
E-6	Fishermen Community Multi-purpose Training Centre	high		■		P	MOFAR
(Agriculture)							
E-7	Agriculture Support Facility, Seed and Fertilizer			■			Farmers Corp
(Small Industry/Manufacture)							
E-8	Cottage Industry -Capacity Building	high	■	■		P	MOI
E-9	Strengthening of Handloom Industry	high	■	■		P	MOI
E-10	Industrial Park (agro, fishery, jewel, etc.)			■	■		Private
E-11	Modernized Slaughter House			■			Municipality
(Other Industry)							
E-12	Business Development Centre			■			Municipality
E-13	Promotion of Tourist Industries			■			Private
E-14	Commercial Industry Promotion (Super Market)			■	■		Private
E-15	Modern Banking System (Financial Services)			■			Private
Urban Development							
(Housing)							
H-1	Housing Development to cope with population increase			■	■		Private
H-2	Housing Development for Tsunami Victims	high	■			P	GOSL
(Education)							
ED -1	Affected School redevelopment	high	■			P	GOSL
ED-2	Public Library with Modern Facilities			■			Municipality
ED-3	Improving Vocational Education System			■			GOSL
(Public Healthcare and Welfare)							
PH-1	Public Toilet Facilities renovation			■			Municipality
PH-2	Hospitals (Renovation of affected Hospital)	high	■			P	MOHC
PH-3	Hospital Contingency Plan as Emergency Relief	high		■		P	MOHC
PH-4	Improvement/development of Hospitals	high		■	■	P	MOHC
PH-5	Home for Elders and Orphans development			■			GOSL
(Public Service Facility)							
U-1	"THONAS" restoration by debris clearance, bank reinforcement, etc.	high		■		P	Collaboration
U-2	Government Quarters Improvement			■	■		GOSL
U-3	Improving the existing Public Halls			■			Municipality
U-4	Public Hall-Cultural Centre development/improvement			■			Municipality
U-5	Crematorium development			■			Municipality
U-6	Police Station and Court Complex Improvement			■	■		Police
U-7	Religious Institutions Development/Improvement			■	■		MOE
U-8	Cemeteries Improvement			■	■		Municipality
U-9	Modernizing Existing Market			■			Municipality
(Amusement)							
U-10	Play Grounds			■			Municipality
U-11	Recreation Facilities			■	■		Municipality
(Transportation)							

Item		Effectiveness	Schedule /1			Priority evaluation /2	Implementing Organization
			U	S	M/L		
U-12	Modern Bus Stand (Terminal) Complex						Municipality
U-13	Ampara Access Roads Improvement with Bridges and Culverts	high				P	RDA/RDD
U-14	Improvement of Coastal Road	high				P	RDD
U-15	Vehicle Parking Spaces (Multi-story parking)						Municipality
U-16	Improvement of Internal Roads	high				P	RDD
U-17	Improvement of Main Roads (A4)	high				P	RDA
U-18	Domestic Airport (renovation of Ampara airport)						MOT
(Utility)							
U-19	Water Supply System Expansion/Upgrading	high				P	NWSDB
U-20	Storm Water Drainage System Improvement	high				P	RDA,RDD
U-21	Sewage Treatment System Improvement (Night Soil Disposal)	high				P	NWSDB
U-22	Dumping Site Development for Garbage and Solid Waste Management	high				P	Municipality
U-23	Electricity Supply System Expansion/Upgrading	high				P	CEB

Note: /1 U: Urgent (within 2 years), S: Short-term Needs (-2010), M/L: Mid/Long-Term Needs (-2030)
/2Urgent project and short term project, which lead effective recovery from tsunami damage, are selected as the priority project.

Source: JICA Project Team

6.4.2 Infrastructure Development

(1) Transportation Facility

1) Current Condition in Kalmunai

Route No.4 is the access to Kalmunai Township with 12 m width pavement and pedestrian deck, which was investigated by JICA for the urgent improvement. Since both sides of the No.4 road in Kalmunai Township are being developed for commercial and residential area, expansion of the road width is difficult. The capacity of the road is sufficient to the present traffic volume of approximately 2,000 vehicles per day and will be enough for the future traffic increase at least within the next decade.

Although small internal roads and a coastal road network are developed in the Kalmunai Township, most of the roads are in poor condition without pavement and drainage structure. Urgent improvement of internal road network of Kalmunai Township is necessary for the disaster management, urban function upgrading, and living environment renovation.

In addition to the above, improvement of public transportation services in Kalmunai, especially renewal of the bus terminal station is desirable. Moreover, improvement of the transportation environment in the business area of the township as well as the improvement of air-access from the national capital is proposed as the mid/long term projects.

2) Transportation Facility Development Plan

Through the discussions in the District Committee and the subsequent study, the proposed improvement plans for the transportation in the Kalmunai Township are developed as summarized below.

Table 6.4.4 Transport Development Plan in Kalmunai Township

Item	Urgent Project （～2007）	riority Project ort term; -2010）	on Priority Project oject (Mid/long term; -2030)	Purpose of Project
Road	Improvement of A4 national Road			ss improvement to Kalmunai (JICA is undertaking FS)
		Improvement of main Access road to/from Ampara		Improvement of submerging section
		improvement of internal road network		Evacuation route improvement, living environment improvement, urban function upgrading
		Improvement of coastal road		
Public Transportation		Renewal of Public bus terminal		Improvement of public transportation service
			reinforcement of transportation environment in the business area (car park development)	Traffic congestion relief, upgrading of business/commercial function
Air Access			Renovation of Ampara Airport	improvement of air-access from the national capital

Source: JICA Project Team

(2) Water Supply and Drainage

1) Present Water Supply System

The water supply programme in Kalmunai is totally related with the Water Supply Scheme for Unserved Areas of Ampara District: "ECTAD (Eastern Coastal Towns of Ampara District) Phase I, II and III" centreed around the Ampara township and extending to the coastal urban areas of Kalmunai municipality and Ninthavur DS.

Water Supply Development Programme for Townships in Ampara District

Townships in Ampara District were previously known as the "contaminated groundwater area" with gray or high electric conductivity of occasionally more than 3,000 μs/cm. In addition, sufficient water amount could not be obtained in some areas due to low groundwater level in the dry season.

To cope with such problematic conditions, NWSDB started the new water supply schemes: "Water Supply Scheme for Unnerved Areas of Ampara District".

The Phase I was targeted for serving water centreed on the Karaitivu and Sainthamaruthu areas with the budget of Rs 2,460 million and supply amount of 4 MGD in total. All of the major works were already completed in 2003.

Regarding the subsequent Phase II scheme, some works have not been completed yet,

though the planned completion date is the end of 2005 due to difficulty of procurement of budget and the occurrence of the tsunami during the implementation period. The target supply areas of Phase II are Irakkaman, Akkraipattu, Adalachchnai, Ninthavur, Oluvil, Marathamunai, and Banglawadiya and the entire project cost is estimated at Rs 7,224 million. The total supply amount after completion of Phase II is expected to be 12 MGD. The schematic diagram for Phase I and II is shown in Figure 6.4.5.

In the subsequent Phase III scheme, NWSDB originally expected Australian financial assistance in the same way as Phase I and II. However, because of the excessive size and subsequent financial burden, NWSDB modified the Phase III plan in the form of "Addendum" with the target year of 2024. Currently, the External Resources Department of the government is finding other funding sources, but has not reached the conclusion. The amended Phase III plan is shown in Figure 6.4.6.

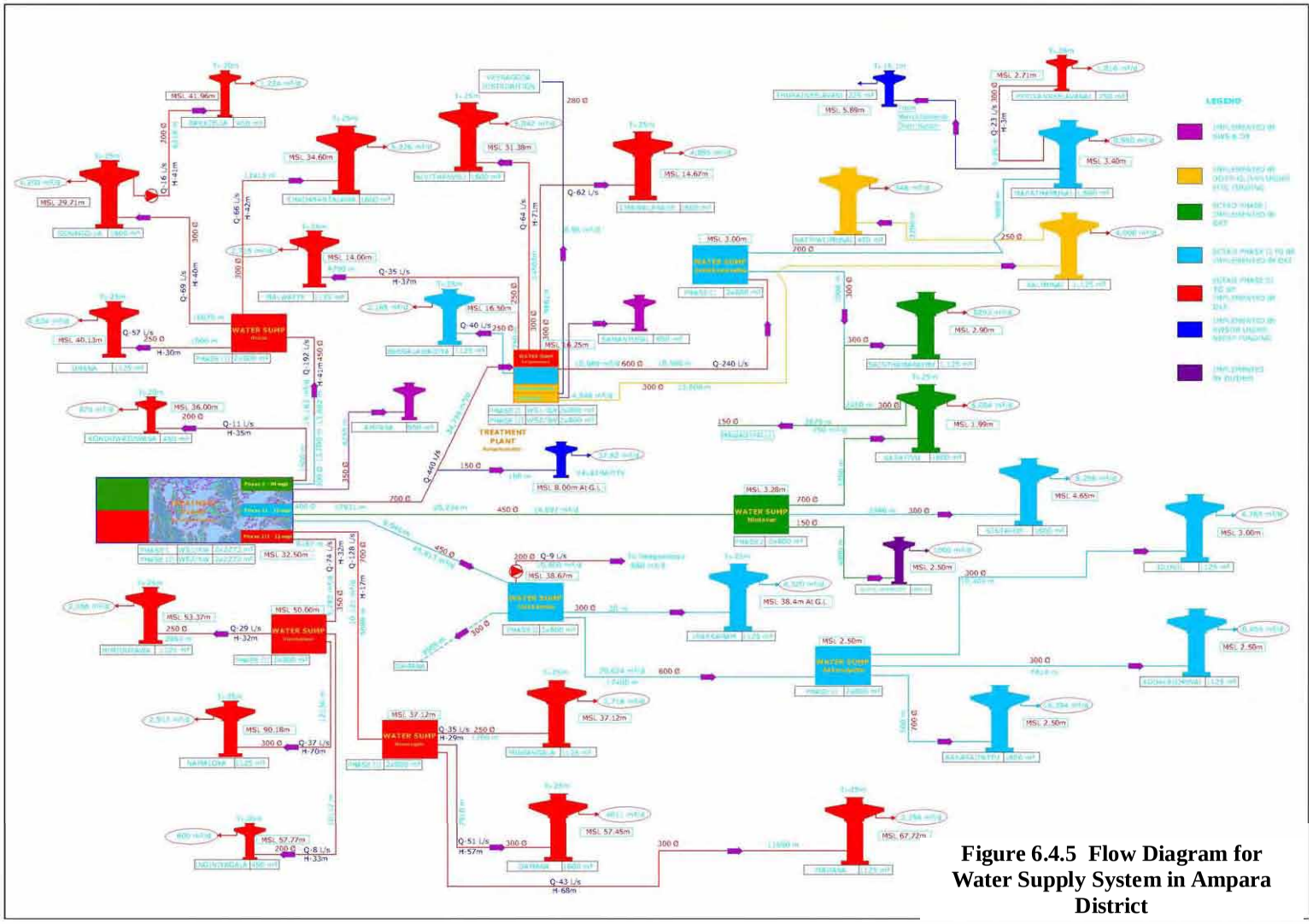
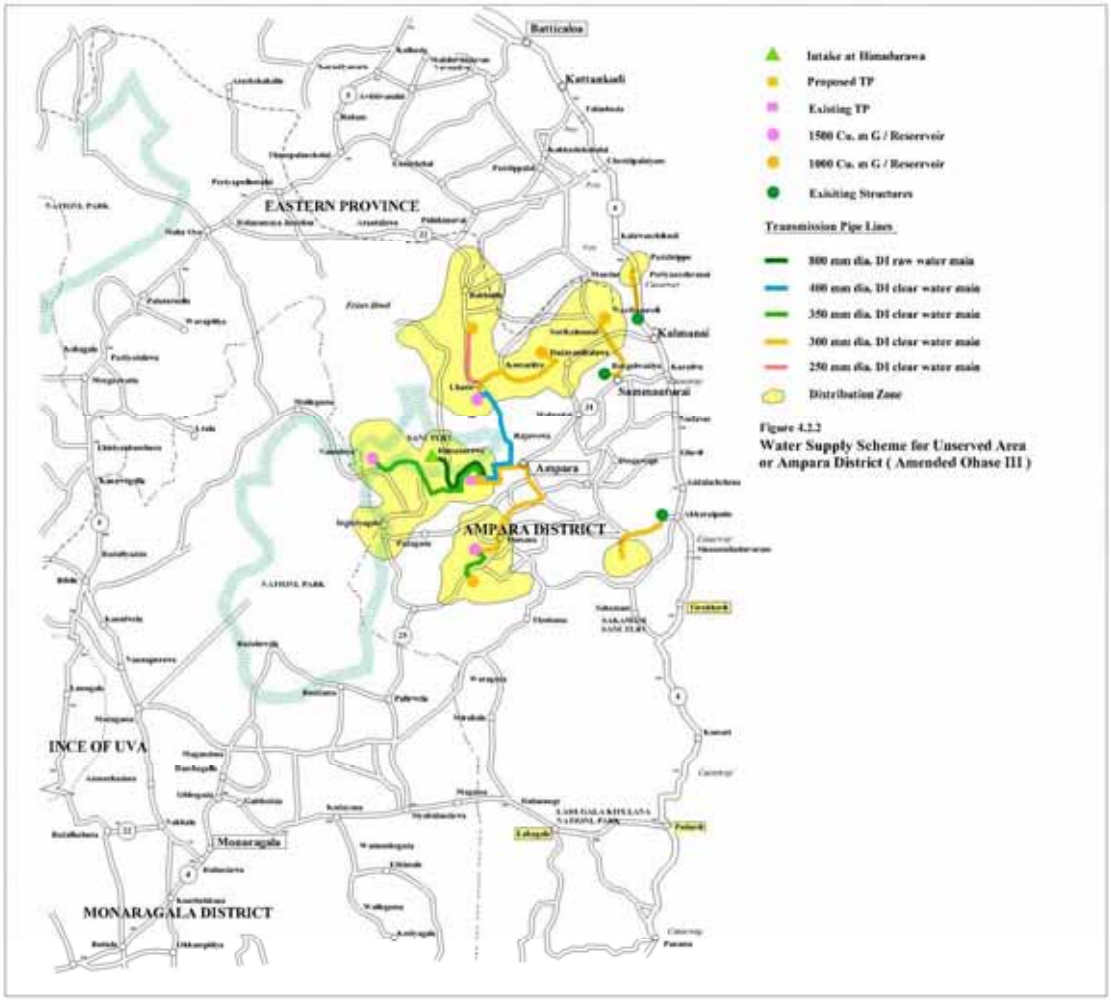


Figure 6.4.5 Flow Diagram for Water Supply System in Ampara District

Source: NWSDB



Source: NWSDB

Figure 6.4.6 Phase III Plan of ECTAD

Meanwhile, the tsunami occurred while financial sources for Phase III were trying to be secured. Immediately after the occurrence, some foreign donors proposed to offer financial and technical support to the water supply programmes in the tsunami affected area in Kalmunai municipality together with some uncompleted programmes in the Phase II scheme.

Currently the works are being carried out by those donors, but without having full collaboration or coordination among them including NWSDB. In addition, the improvement and extending schemes currently being carried out in the Kalmunai municipality area are suffering from the insufficiency of upstream transmission pipes in their capacities.

Water Supply Planning in Kalmunai Municipality

The water supply to the Kalmunai Municipality is provided by the transmission pipe of Dia.400 mm from the treatment plant located in the Ampara Township to the Bantarawadiya pump sump. However, this pipe capacity is insufficient and should be enlarged to Dia.700 mm to handle the increasing demand. At the same time, subsequent transmission pipe of Dia.300 mm from Bangarawadiya pump sump to the Sainthamaruthu pump sump located in the Kalmunai Municipality should be also enlarged to Dia.600 mm. The location is shown in Figure 6.4.7.

Without enlarging those pipes, sufficient water supply to the Kalmunai areas will not be able to be provided. The former transmission pipe is proposed to be improved by FINIDA (Finnish International Development Agency) and the latter is proposed to be improved by either or by co-finance of FINIDA and DANIDA (Danish International Development Agency). The improvement of these transmission pipes is the prerequisite for development of the Kalmunai water supply system.

Meanwhile, the distribution pipe system in the Kalmunai Municipality was already provided at relatively satisfactorily level. However, after the tsunami the necessity of rehabilitation and extension of the distribution pipe system has become acute, since many of the beach households lost their wells or the wells were contaminated by saline water and the residents demanded to switch to the surface water system. Currently, rehabilitation and extension works are being carried out by the assistance of DANIDA extensively targeting rehabilitation of 2,100 households' connection.

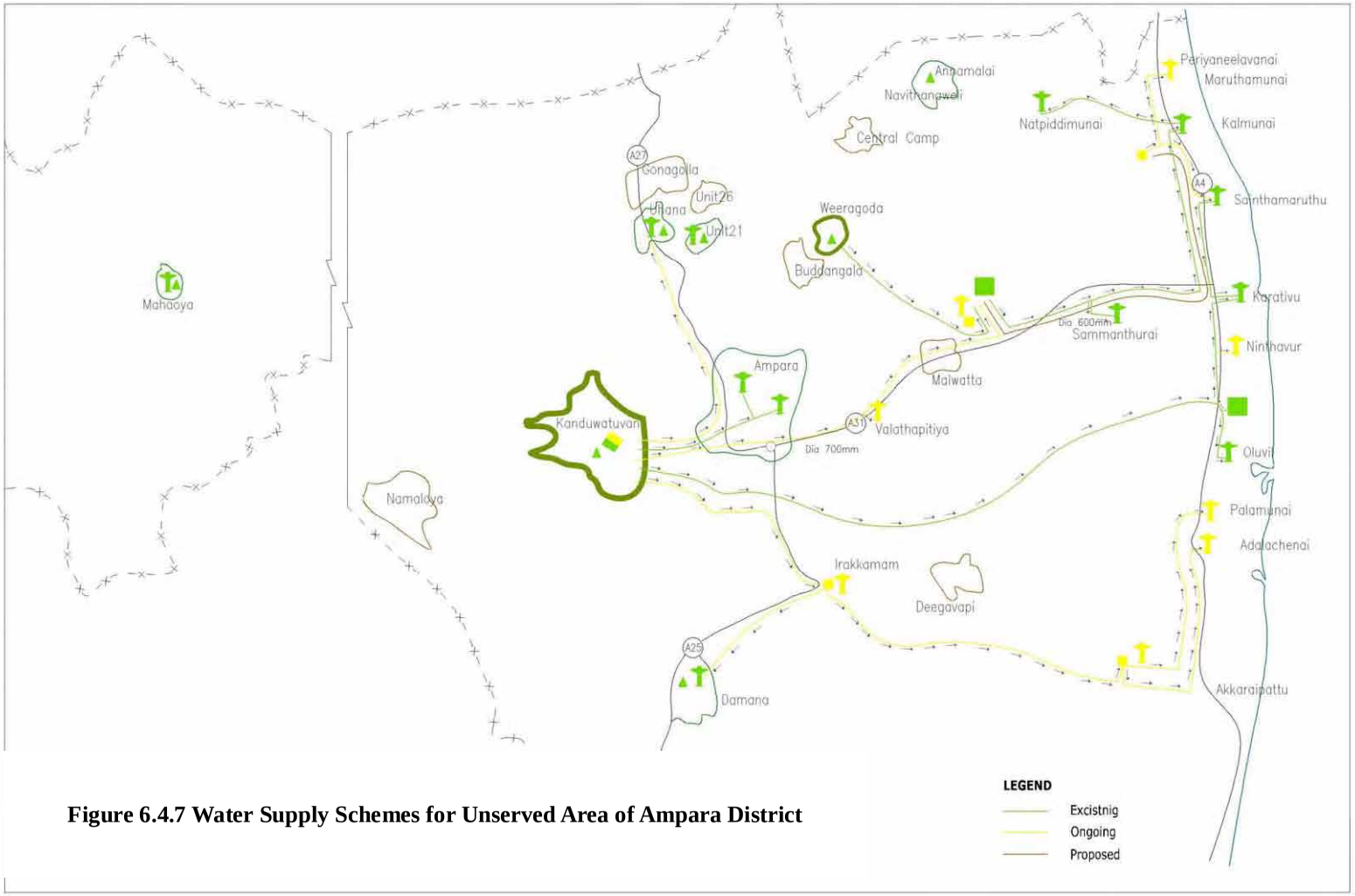


Figure 6.4.7 Water Supply Schemes for Unserved Area of Ampara District

Source: NWSDB

2) Development Plan with the Target Year of 2030

As mentioned above, the future water supply system in the Ampara township as well as the Kalmunai Township has already been planned to a certain level, namely to a feasibility study level. However, the following are the key issues to be considered for establishing the future water supply plan for the year 2030.

The new Kalmunai Township Redevelopment is being planned including population projection, town planning, land use and infrastructure plans. These plans should be fully incorporated at the time of the review work of the existing water supply system development plans/projects.

At the same time, neighboring urban towns such as Ninthavur and Oluvil in the south of Kalmunai municipality should also be taken into consideration, since some pipelines connected in Kalmunai municipality are shared by those areas. Comprehensive master planning should be prepared and the full review study of the ECTAD Phase III is indispensable.

(3) Stormwater Drainage System

1) Inundation Damage Caused by Storm Water

The residents living in Kalmunai Municipality, Sainthamaruthu DS and Nintabur DS have suffered from the inundation caused by the storm water in rainy season. Figure 6.4.8 and 6.4.9 shows the condition of inundation depth and duration surveyed in the course of this project by conducting the questionnaire survey.

The figure revealed that the inundation occurred every year in almost all the areas and the depth reached more than 1.0 m in some areas. At the same time, the duration of inundation was more than 10 days at the heavy rainfall.

According to the questionnaire survey on the “improvement requirement” for the infrastructure, approximately 30% of the residents have deep concern with the flood protection issue as indicated in Figure 6.4.10.

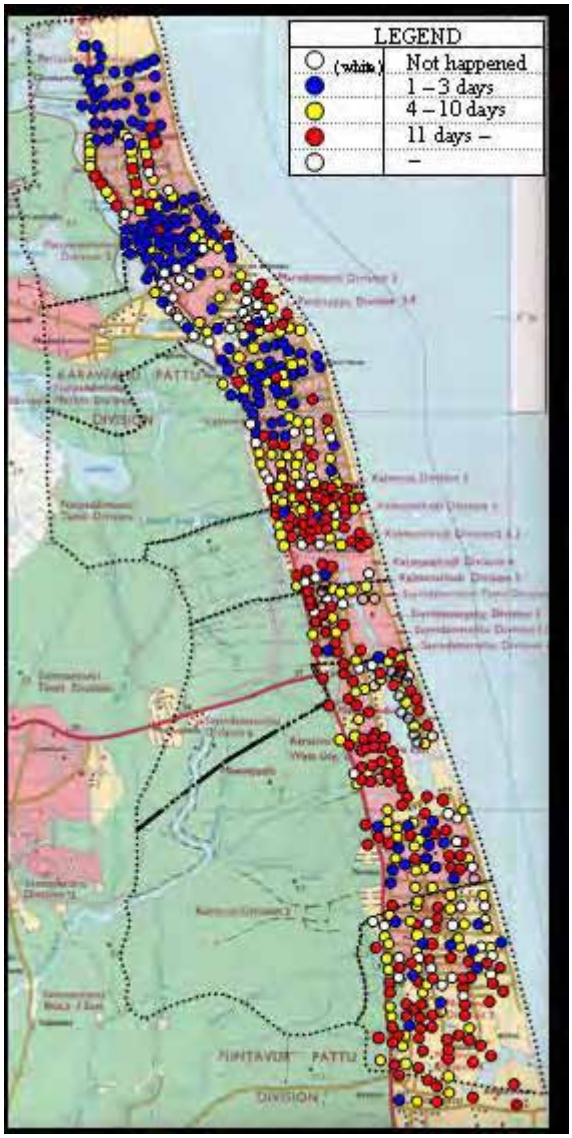


Figure 6.4.8 Inundation Duration in Kalmunai and Sainthamaruthu

Figure 6.4.9 Inundation Depth in Kalmunai and Sainthamaruthu

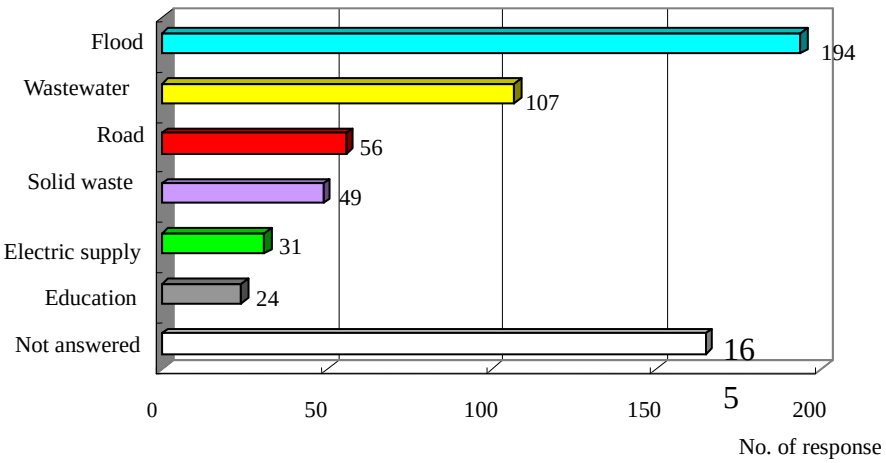


Figure 6.4.10 Results of Improvement Requirement Survey

2) Natural Conditions and Current Prevention Measures

Rainfall

Figure 6.4.11 shows the monthly rainfall in Batticaloa adjacent to Kalmunai. The rainy season starts in September and ends in March. The mean annual rainfall from 1961 to 1990 was 1,651 mm. December is the peak rainfall month in a year and the mean monthly rainfall of this month is 419 mm. It is reported that the inundation generally occurs during this period.

The rainfall Intensity-Duration-Frequency curve in Batticaloa prepared by the Irrigation Department is shown in Table 6.4.5 and Figure 6.4.12. The rainfall intensity for the 5-year return period is about 60 mm/hr.

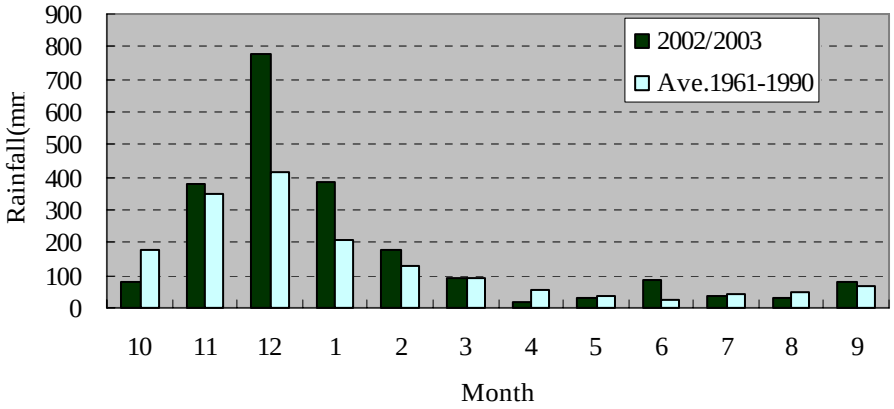


Figure 6.4.11 Monthly Rainfall at Batticaloa

Table 6.4.5 Rainfall Intensity-Duration-Frequency

Return Period Years	2	5	10	25	50
Time in Hrs.	Depth of the Rainfall in mm				
0.15	92.45	109.72	120.9	135.12	146.3
0.5	69.59	84.32	93.99	106.17	115.32
1	49.53	60.19	67.31	75.95	82.56
2	29.84	39.42	45.84	53.97	59.94
6	12.86	17.82	21.12	25.27	28.32

Source: Irrigation Department

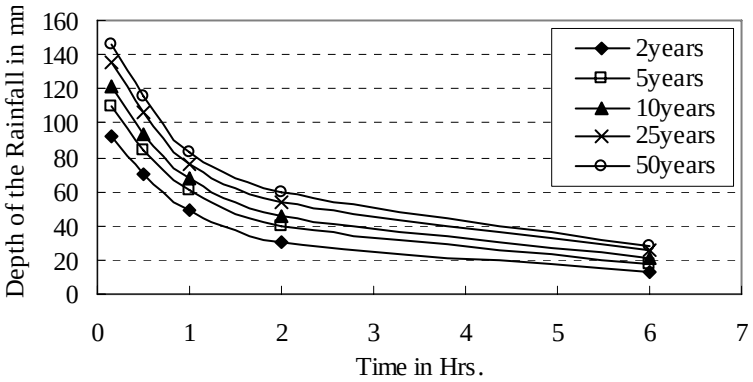


Figure 6.4.12 Rainfall Intensity-Duration-Frequency Curve

Topographic Configuration

The urban area in Kalmunai Municipality lies on the low coastal sand dune. The municipality area has a width of 1.0 km from east to west and 10 km from north to south, and its east edge is facing the Indian Ocean.

The highest ground elevation in the municipality is only MSL+4.0 m and the ground elevation at the national road A4 located in the west end of the municipality is MSL+2.5. This means that the gradient of the east-west roads in the area is only 0.1% and extremely flat terrain.

Drainage Facilities

Street drains or drainage channels are installed in very limited areas and there are no drainage facilities in the rest of the area. The Road Development Authority constructed the street drains along the A4 road and also some box culverts crossing the A4 road to discharge storm water to the swamps in the west end of the municipality. Those box culverts do not have enough capacity for discharging.

Households Prevention Measures

Photo 6.4.1 and 6.4.2 show the typical condition of the road without drainage facilities and the soil embankment at the entrance to protect storm water is provided.

Photo 6.4.1 Unpaved Road without Drainage Facilities in Project Area

Photo 6.4.2 Prevention of Storm Water Intrusion by Embankment at the Entrance of a House

2) Mitigation Measures from Inundation

Necessity of Implementation of Master Plan for Drainage Improvement

Because of the characteristics of the flat low lying terrain that the municipality is located on the elevation with only MSL+2.5 on an average and surrounded by swampy area in the west, the discharge of the storm water is considerably difficult. The storm water in the residential area is rarely discharged to the neighboring lagoon and the outlet of the lagoon is normally clogged by sand dune. When the inundation water level raises high after heavy rains, the sand dune is often opened manually or by using excavation machines.

In order to solve such inundation problems, comprehensive investigations and study are inevitable not only for the township area, but also for the entire catchments area. The required overall development plan for flood control is to include the following.

Framework of the Master Plan

i) Target Year	:	2030
ii) Objective	:	To facilitate necessary drainage facilities to mitigate inundation in the township area and to provide the necessary implementation programme.
iii) Study Area	:	Kalmunai Municipality and surrounding area including upstream catchment area.

Preliminary Plan for Improving Drainage

The target area can be divided into three areas, namely the Indian Ocean Drainage

Area, the Lagoon Drainage Area, and the Sainthamaruthu Drainage Area as shown in Figure 6.4.13.

a) Indian Ocean Drainage Area

The storm water in northeastern part of the target area flows directly into the Indian Ocean. The drainage area is about 500 ha and this area shall be tentatively named the Indian Ocean Drainage Area.

The distance from the Indian Ocean Drainage Area to the Lagoon Drainage Area as mentioned below is around 700 m. The maximum ground elevation of this drainage area is MSL+4 m and the elevation of the coastal road is around MSL+3 m.

The improvement concept is as follows.

- The trunk mains and lateral sub-mains will be installed along roads.
- The trunk mains will be installed from west to east from near the boundary to the Lagoon Drainage Area to the Indian Ocean.
- The trunk mains will be box culvert and the lateral sub-main will be open channel.
- Regulating tanks will be constructed at the outlet to the Indian Ocean to protect back water from the sea to the trunk mains.
- The ocean side embankment of the regulating tanks will be mechanically cut in case of heavy rain to lower the water level in the trunk.

b) Lagoon Drainage Area

The storm water in the western area next to the Indian Ocean Drainage Area flows into the lagoon. The dimension of the drainage area is about 470 ha and named tentatively as the Lagoon Drainage Area.

The distance from the boundary to the Indian Ocean Drainage Area to the lagoon is around 300 m. The maximum elevation of this drainage area is also MSL+4 m located near the border of the Indian Ocean Drainage Area. The elevation of the A4 road is about 2.5 m.

The improvement concept is the same as the Indian Ocean Drainage Area except

the following points.

- The regulating tanks are not necessary because there is no back water effect by the sea wave.
- Planning and designing of the trunk mains crossing to the A4 road be discussed with the Road Development Authority.
- Current and future water level of the lagoon where the storm water is discharged to be carefully surveyed.

c) Sainthamaruthu Drainage Area

In the southern part of the Kalmunai Municipality, the storm water flows into the Thonas (small lagoon) that connects to the Indian Ocean. The area is about 210 ha and shall be named the Sainthamaruthu Drainage Area.

This drainage area is one of the most severely damaged areas. The sand dune with an elevation of about 1 m blocks the inner water from flowing to the Indian Ocean and aggravating the drain condition during heavy rain.

The improvement concept of this drainage area is as follows.

- The trunk main and lateral sub-main will be installed from urbanized area to the Thonas and the canal.
- A working stage for the backhoe will be constructed to cut the sand dune mechanically when the water level of the Thonas and the canal rises.
- A backhoe will be purchased and kept nearby the working stage.

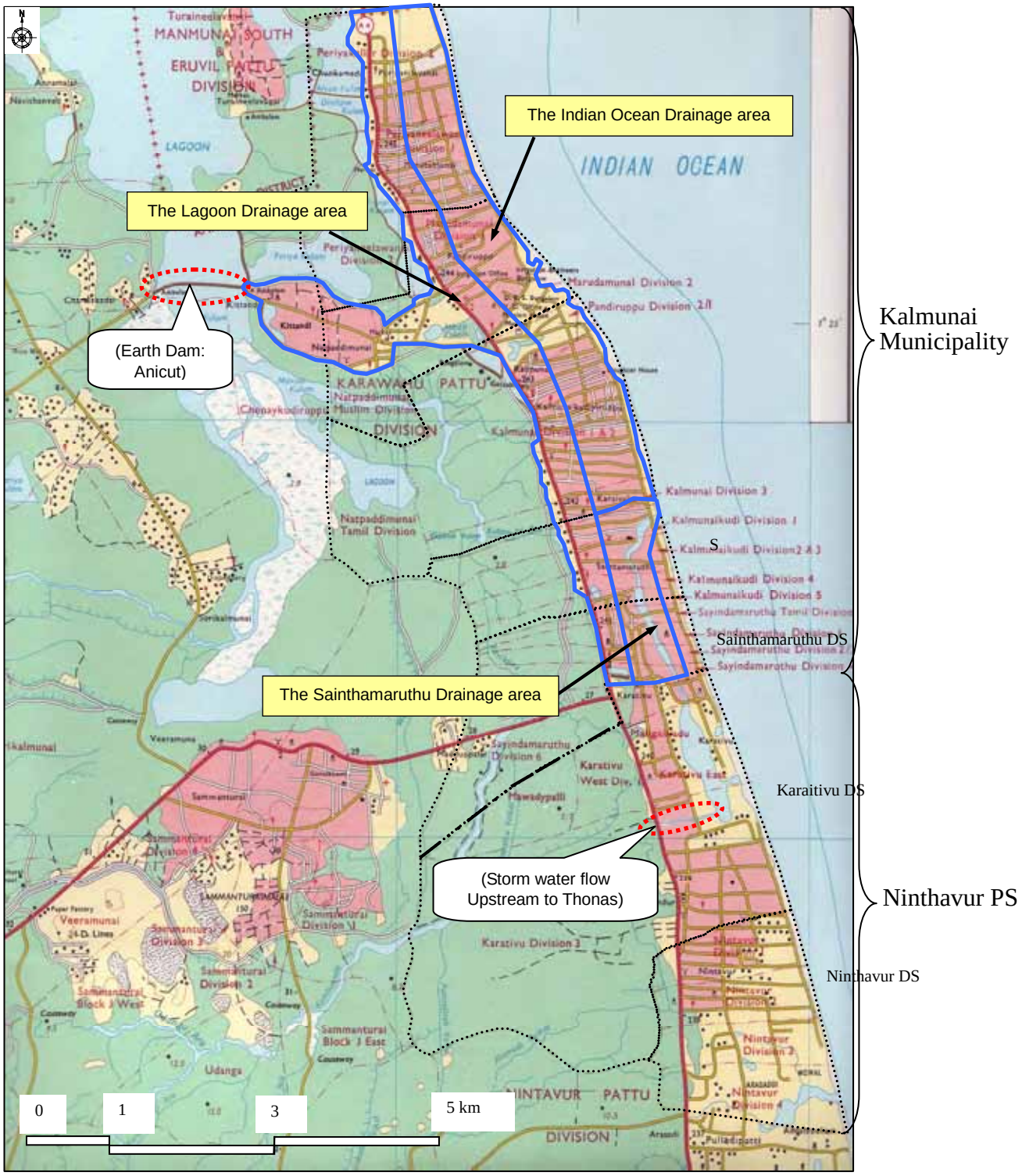


Figure 6.4.13 Proposed Drainage Areas in Kalmunai Municipality

Strategies for Mitigation

Although topographic and hydraulic conditions should be surveyed in detail, the gravity flow system without pumps is the prerequisite for the sustainable planning.

(4) Solid Waste Management

1) Current Conditions

Based on this unit rate of 0.4 kg/person/day and population data, the present municipal solid waste generation from household in Kalmunai Municipality is estimated at approximately 40 ton/day.

The tractor trailers of Kalmunai Municipality Council (KMC) collect solid waste and transport to the dumping site located in the central part of Kalmunai Municipality currently relocated from the play grounds which were tentatively used as an urgent dumping site after tsunami.

The frequency of collection is generally irregular from once a day to once a week depending on the area. Currently, Kalmunai Municipality has 7 tractors of which capacity is approximately 2 tons. After the tsunami, 6 tractors were additionally procured. Each vehicle usually collects the solid waste and transports them to the present dumping site at approximately 3 times a day. It is reported that residents occasionally and illegally dispose the solid waste along the river or in the marsh land.

The area of existing disposal site is approximately 1.5 ha and does not have enough capacity for the future dumping as shown in Figure 6.4.14. The site is located in the midst of the KMC and is surrounded by residential areas dispersing odor and vermin problems.

KMC looked for the suitable dumping site in the surrounding area and Oluvil site is identified as the most suitable site as shown in Figure 6.4.15.

Figure 6.4.14 Location of Solid Waste Dumping Site and Recycle Shops

Figure 6.4.15 Proposed Landfill Site at Oluvil

KMC has not been carrying out extensive recycling activities up to now. There are some private recycling shops in Kalmunai Municipality. The collected materials are generally transported to Colombo and exported to other countries such as India. The collected materials are mainly plastic, glass bottle and metal such as scrap iron, brass and aluminum.

On-going Activities by International Donors

A Solid Waste Management Improvement Plan for Kalmunai Municipality was prepared by the consultants of Netherlands. Basic concept of the plan is to develop clean city with promotion of recycling activities. However, the plan is still a conceptual level which does not include detail plans.

The international NGOs such as GOAL and OVERSEAS have been carrying out the assistance for the solid waste management in Kalmunai Municipality. GOAL has been cleaning the rivers and surrounding swamps and provided tractors to support

collection and transportation of solid waste.

OVERSEAS has been carrying out the community participation programme of the solid waste management. The group supports teaching method of home composting and community participation. Although, objective areas are located outside the planned area, the process and progress of the programme may be utilized for the improvement plan for solid waste disposal and recycling activities.

2) Solid Waste Management Plan

It is planned that the solid waste is to be collected, transported and disposed at the proposed dumping site under the management of KMC. Estimate of the solid waste generation with the target year of 2030 is made taking into account the experience of Sri Lanka and other Asian countries.

i) Waste collection rate is 80% and is to be disposed at a dumping site.

ii) Recycling rate including inorganic material and composting is proposed at15%.

iii) 5% of residue out of the total generation amount is to be self-disposed.

Estimation of Solid Waste Amount

The estimation of solid waste generation was made based on the projected population as presented below.

Table 6.4.6 Population and Solid Waste Generation Prediction

Year	Population of whole planning area	Generation Amount (ton/d)
2005	102,000	40.8
2010	114,000	45.6
2020	150,000	60.0
2030	176,000	70.4

Source: JICA Project Team

Collection and Transportation Method

For the collection of solid waste, a compactor track will be suitable for collection and transportation. However, since there are a lot of narrow streets within the planning area making it difficult to collect the solid waste, the existing tractor and trailer will be fully utilized. In addition, handcarts will be utilized for collection and transportation for the limited distance. The proposed tentative collection system is summarized in the following table.

Table 6.4.7 Tentative Collection Plan of Solid Waste

Item	Contents
Collection	Basically 4 times/week
Collection time	From 06:00 to 15:00
Compactor (capacity 5 ton)	Year 2010: 5 vehicles Year 2020: 6 vehicles Year 2030: 8 vehicles

Source: JICA Project Team

Plan of Final Disposal

Conceptual plan of final disposal is summarized as follows.

Table 6.4.8 Conceptual Plan of Final Disposal

Item	General specification
Administrative building	100m^2
Landfill area	Year 2010: 1.0 ha Year 2020: 2.5 ha Year 2030: 4.5 ha (150 m x 300 m)
	dditional 1.0ha for debris waste (70 x 150m)
Access road	200m
Storm water drains	1,200m
Liner system	Natural clay soil layer
Leachate collection pipes	PVC Perforated pipe with diameter of 200mm, 300mm
Leachate treatment pond	Infiltration to the ground
Gas Collection System	Vertical vent
Fencing	300m
Weigh Bridge	For 40t capacity including foundation and necessary equipment
Maintenance Workshop	As required
Utilities	As required

Source: JICA Project Team

(5) Sewage Treatment and Disposal System

1) Back Ground and Needs

More than 90% of the households in the Kalmunai Township area use a cess pit for disposal of sewage, while only about 2% of the households use septic tank and soak pit. The remaining has no toilet around their houses, and disposes excrement at the beach.

One of the major reasons that the people in Kalmunai use a cess pit is that the construction cost of the septic tank is high and the soil condition around the houses is sandy soil which can easily absorb sewage.

Due to such reasons, sewage disposal or night soil disposal is not a serious problem. However, many people still use wells to get drinking water and these wells are situated quite near to the cess pits causing groundwater contamination.

Issues for Sewage Disposal are as follows.

- Rising of groundwater table during rainy season

  During the rainy season, groundwater table rises and night soil and wastewater become difficult to infiltrate into the ground bringing causing overflow of the cess pit, odor generation and subsequent environmental deterioration.

- Groundwater contamination

  The residential area in Kalmunai Township is extremely densely populated. Because of this high density, the wells used for their drinking purpose are also densely situated together with septic tanks and cess pits. In case of inundation, groundwater table raises and groundwater contamination will prevail to a large extent. Particularly, the water related diseases are envisaged to break out and spread easily.

2) Sewage Treatment and Disposal Plan for 2030

Introducing the central collection and treatment of sewage by pipe reticulation system is premature to adopt for Kalmunai Township. In such a condition, the inundation problem should be solved separately as a drainage improvement programme.

The other measure for improving sewage system in Kalmunai Township is to establish the system of appropriate or timely abstraction of the night soil periodically from the septic tanks. All the cess pits should be converted to septic tanks as early as possible.

The wastewater from the kitchen and bathroom should be also treated by septic tanks and the sludge accumulated in the tank should be taken away from time to time.

The night soil and sludge taken from the septic tanks should be transported and disposed of at a suitable place. Construction of a new night soil treatment facility is proposed at the site near the centre of Ampara Township. To implement this, topographic surveys and soil investigations are to be carried out.

(6) Electricity

1) Present System and Ongoing Projects

The electric power supply to Kalmunai is now supplied from Ampara Grid substation by 2 circuits of 33 kV overhead lines. The specification of the line is Racoon of which capacity is about 17 MVA.

Ampara Grid substation is connected to Inginiyagara Power station by single 132 kV overhead transmission lines of which specification is Lynx (about 22 MVA) and consist of 2 sets of 132 kV/33 kV, 31.2 MVA step-down transformers.

The public utilities such as electric facilities were damaged by the tsunami. However, almost all of the related facilities have been already recovered by technical and financial aid of JBIC, ADB, WB and other donors as part of urgent projects. The major on-going projects being carried out are shown in the following table.

Table 6.4.9 Major On-going Project to Power Sector

Donors	Description	Remarks
JBIC (STAART)	Infrastructure Rehabilitation Programme to Power Sector	29.22 M US$
ADB (CAARP)	Conflict Affected Areas Rehabilitation Project	Power (24.8 M US$)
ADB (NECORD)	North East Community Restoration and Development Project	

Source: JBIC and ADB

2) Demand Forecast

Preliminary demand forecast for electric power were made based on the existing data and assumptions.

Table 6.4.10 Peak Demand Forecast

Description	Unit	2005 to 2010	2011 to 2020	2021 to 2030
Rate by Population Estimation	%	2.2	2.7	1.6
Annual Average Increasing Rate	%	5.0	6.0	4.0
Peak Demand at Kalmunai	MVA	25	45	67

Source: JICA Project Team

3) Electric Power Supply Plan

Ceylon Electricity Board (CEB) prepared a future plan for electronic power supply that is to be applied to KTRP.

Table 6.4.11 Future Plan by CEB

Description	Year	Present	Proposal
Ampara Grid Substation			
1) Augmentation of Transformer	2005	2x31.5 MVA	3x31.5 MVA
2) Installation of Capacitor	2005	None	Total 30 MVA
New Transmission Lines			
1) Rantembe → Ampara	2007	From Badulla	2x132 kV, Zebra
2) Ampara → Padirippu (35 km)	2009	None	2x132 kV, Zebra
New Grid Substation			
1) Padirippu S/S	2009	None	2x31.5 MVA

Source: Long Term Transmission Development Studies 2004 – 2013 (CEB)

6.5 Priority Programmes for Early Implementation

6.5.1 Selection of Priority Programmes

Priority programmes were selected through the following process:

1) Proposed priority projects presented in Table 6.4.3 for KTRP were further reviewed and final selection of the priority projects to be included in this study was made in due consideration of commitments of other donors, NGOs, and government agencies concerned (the committed projects were excluded) as shown in Table 6.5.1.
2) The selected high priority projects were integrated into the following three priority programmes:
   a) Restoration Programme for Urban Environment
   b) Disaster Mitigation and Management Programme
   c) Livelihood Restoration Programme

The background, needs and project components for the three programmes are described hereunder.

Table 6.5.1 Priority Projects to be include in this Study

Priority Projects		Present progress		Selected to be included in this study/ design
Disaster Mitigation and Management				
DM-1	Disaster Mitigation Training Knowledge Empowerment	DMC is in charge, but no actual progress for Kalmunai	→	Included in Disaster Mitigation and Management Programme
DM-2	Public Awareness System incl. Information Board, etc.			
DM-3	Plantation in the Coastal Buffer Zone	Goal is in charge		
DM-4	Tsunami Memorial Park / Museum development	UDA Kalmunai in charge, but no actual progress.	→	ditto
DM-5	Evacuation Plazas (Aid centre after disaster) development	DMC is in charge		
DM-6	Storm Water Drainage System Improvement (same as U-20)	n.a.	→	Included in Disaster Mitigation and Management Programme
Livelihood Restoration				
(Fishery Industry)				
E-2	Boat Gear Storage Improvement		→	Included in Restoration Programme for Urban Environment
E-5	Redevelopment of Transport Support Facility	Ice plant by JICS		
E-6	Fishermen Community Multi-purpose Training Centre	Goal, GVC are in charge		
(Small Industry/Manufacture)				
E-8	Cottage Industry -Capacity Building	NGOs are in charge in some fields, but unexploited resources utilization is not done.	→	Included in Livelihood Restoration Programme (Pilot project of local cottage industry promotion utilizing unexploited resource was done by JPT)
E-9	Strengthening of Handloom Industry	NGOs are in charge.		
Urban Environment Development				
(Housing)				
H-2	Housing Development for Tsunami Victims with Immediate Land Reclamation	NGOs are in charge.		
(Education)				
ED -1	Affected School redevelopment	MOE is in charge.		
(Public Healthcare and Welfare)				
PH-2	Hospitals (Renovation of affected Hospital)	INGO is in charge.		
PH-3	Hospital Contingency Plan as Emergency Relief	MOH is in charge.		
PH-4	Improvement/development of Hospitals	MOH is in charge.		
(Public Service Facility)				
U-1	"THONAS" restoration by debris clearance, bank reinforcement, etc.	n.a.	→	Included in Restoration Programme for Urban Environment
(Transportation)				
U-13	Ampara Access Roads Improvement with Bridges and Culverts	n.a.	→	Included in Restoration Programme for Urban Environment
U-14	Improvement of Coastal Road	n.a.		
U-16	Improvement of Internal Roads	n.a.		
U-17	Improvement of Main Roads (A4)	JICS		
(Utility)				
U-19	Water Supply System Expansion/Upgrading	Australia ODA		
U-20	Storm Water Drainage System Improvement	n.a.	→	Included in Disaster Mitigation and Management Programme
U-21	Sewage Treatment System Improvement (Night Soil Disposal)	World Vision is studying/PP by JPT should be replicated.		Included in Restoration Programme for Urban Environment
U-22	Dumping Site Development for Garbage/debris and Solid Waste Management	US Aid is studying, but no actual commitment was done.		Included in Restoration Programme for Urban Environment
U-23	Electricity Supply System Expansion/Upgrading	Done by CEB		

Source: JICA Project Team

6.5.2 Restoration Programme for Urban Environment (Programme 1)

(1) Internal Road Network

To improve the transport situation of the Kalmunai Township, redevelopment of the internal road as well as intra-city main road is required. The improvement project consists of the following three components.

1) Improvement of Intra-city Main Road

Improvement of National Road A4

Improvement includes A4 National Road extending 11 km along urban area of Kalmunai municipality and Nintavur town to renovate pavement and drainage structure. The improvement works will be only within the right of way because the road width can not be expanded due to the intensive land-use along the road. Detailed study of A 4 road inclusive of the 11km section was completed under the technical assistance of JICA and is planned to be implemented soon.

Improvement of National Road A31 connecting Ampara

National Road A 31, a regional main road connecting district capital of Ampara with Kalmunai Township is submerged by heavy rainfall during every rainy season as shown in Photo 6.5.1. The crossing point of a small river at the entrance of Kalmunai city always affected after torrential rainfall will be improved by raising the elevation of the road bed. A new bridge will also be necessary.

Photo 6.5.1 Submerged A 31 Road

Table 6.5.2 Priority Projects of A31 National Road Improvement

Improvement	Contents
Improvement of road bed	Rising elevation with approximately 1.5km distance section
New bridge	Existing one lane old bridge should be replaced by 2 lane new bridge with the length of approximately 50m.
Total	

Source: JICA Project Team

2) Improvement of Internal Road and Coastal Road

Internal roads of Kalmunai Township constitute the local road network. Unpaved and poor drainage road makes transportation inconvenient and uncomfortable especially during rainy season.

Priority projects to be implemented in the short term range will be 1) improvement of major internal roads connecting A4 and coastal roads, 2) improvement of major sections of the coastal road.

Table 6.5.3 Internal Road Improvement in Kalmunai Township

Improvement	Contents
Improvement of major internal road	Renovation of pavement, drainage facilities and possible width expansion in following major internal roads will be the project contents. 1) VC Road 950m 2) Mashoor Moulana Road 1,100m 3) Pullayar Road 1,030m 4) Thalawadovvan Road 930m 5) Rest House Road 1,050m 6) Tharauu Road 1,050m 7) Sahibu Road 990m 8) Zahira Collage Road 1,040m 9) Mawadi Road 1,020m 10) Al Hilath (North) Road 980m 11) Kraitivu-Sainthamaruthu Boundary Road 1,000m* 12) Palayadi Pillayar Kovil Road 1,060m Total 12,2000m
Improvement of parts of coastal road*	Renovation of pavement, drainage facilities and possible width expansion in coastal road will be the project contents. Length; app. 8,300m

*: Urgent repairing of the tsunami damaged pavement/drainage facilities was already done by the assistance of Sri Lanka Tsunami-Affected Areas Recovery and Takeoff Project-Infrastructure Rehabilitation Programme (STAART-IRP) sponsored by JBIC.

Source: JICA Project Team

(2) Debris Clearance and Solid Waste Management

1) Background and Needs

Since the occurrence of the tsunami in December 2004, debris clearance has been one of the most serious problems for the KMC (Kalmunai Municipal Council) to tackle. During the ten months after the tsunami, not only the KMC but also some NGOs contributed technically, financially and managerially to solve the debris clearance problem. However, because of the huge quantity of debris, it was not able to be cleared and disposed of completely in a short period.

Domestic solid waste disposal is also a serious problem to be solved by the KMC. Even before the tsunami occurrence, the domestic solid waste disposal was a difficult and nuisance issues for the KMC.

Under such conditions, the solid waste disposal together with the debris clearance problem became urgent issues to be solved for the KMC. The KMC has been seeking technical and financial assistance or donors to tackle this issue, but no practical solution has been found so far.

The plans for debris and domestic solid waste disposal to be implemented by 2010 are as follows.

2) Facility Plan for Debris and Solid Waste Disposal

The major facility plan includes the following.

Table 6.5.4 Major Facility Plan for Debris and Solid Waste Disposal

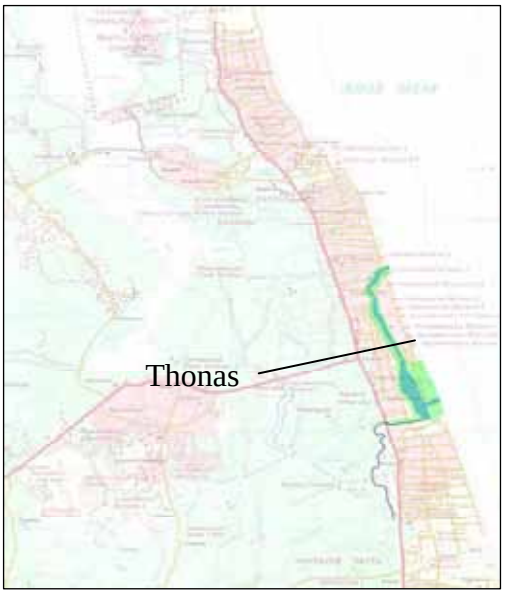
Major Facility		Specification
1	Collection vehicle	• 5 units of compactor with the capacity of 5 ton
2	Landfill site	• 1.0 ha landfill site (70 m x 150 m) • 1.0 ha debris dumping site (70 m x 150 m)
3	Treatment facility	• Leachate collection perforated 200 mm PVC pipe • leachate treatment pond (20m x 40m)

Source: JICA Project Team

(3) Urban Amenity Improvement along Thonas

1) Background and Objectives

Development of the water front is one of the most effective measures for creating an attractive urban environment. Thonas is one of prospective resources for water front development in Kalmunai. Thonas represent typical geographic characteristic in eastern part of Sri Lanka, functioning as drainage creeks during rainy season, while it is closed water in dry season. Thonas is located in Karaitivu DS, Saithamaruthu DS and Kalmunai Tamil DS as shown Figure 6.5.1.



Source: JICA Project Team

Figure 6.5.1 Location of Thonas

This project aims to enhance attractiveness of the town by improving water front recreational areas and to develop the Thonas as the core for an environmentally-friendly township.

2) Current Conditions and Development Approach

Development of the Thonas basin has not been controlled. Therefore, an overall plan for the basin including multi sector approach is essential. In particular, harmonization of the natural environment with improvement of living condition and industrial development should be taken into account.

Development approach to the Thonas is as explained below.

Upper reach

Lagoon and wetland in the upper reach is proposed to be reserved as a nature preservation area. Water contamination or tree/bush cutting will not be allowed in the preserved area.

Middle reach

Development of the water front residential area is possible under the harmonization of the natural environment.

Lower reach

Some sections are already reclaimed by debris. Improvement of damaged sections by excavation work and construction of urban amenities are necessary. Urban amenities can be the destination of tourist along the estuary area.

Estuary

The fishermen's wharf will be developed in the estuary area. An integrated development with a fishing boat mooring zone and fish market is proposed.

Proposed projects for the Thonas improvement are presented in the Table 6.5.5. An image for improvement contrasted with the present situation is summarized in Figure 6-5.2.

Table 6.5.5 Project Components of Thonas Improvement

Project Component		Plan
Fishermen's Wharf in Estuary		
	Fish market	Fish collection facilities such as ice storage, packing space, etc.
	Fish community centre	Workshop for fish products processing, training space, meeting space, etc. INGO committed the construction of comprehensive building.
	Restaurants/shops	Tourists destination with water front amenities such as walking deck/park
	Mooring area	Improvement of fishing boat mooring area.
Improvement and development of urban amenities in the lower reach		
	Improvement of damaged environment	Excavation and disposal of debris
	Urban amenity construction	River side promenade deck/park will be constructed.
	Bank protection	Damaged bank should be repaired for protection.
Development of water front residential area in the middle reach		
	Land use control	Private initiative development of the water front residence will be invited under the strict land use control. Integrated land use plan is necessary.

Source: JICA Project Team

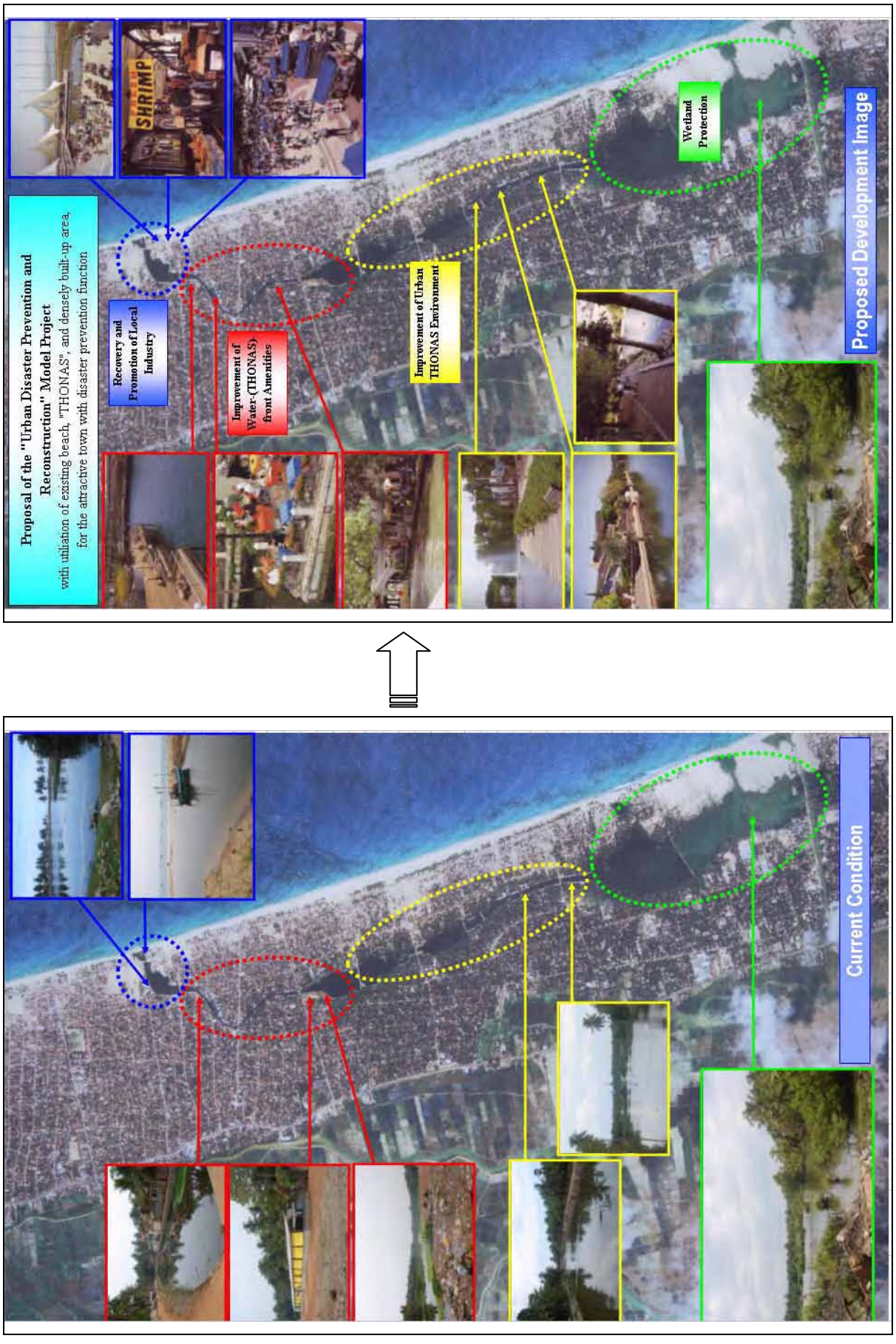


Figure 6.5.2 Image of Thonas Improvement Source: JICA Project Team

(4) Memorial Park

1) Objectives

Tsunami Memorial Park is planned with following objectives.

- To provide a symbolic place to commemorate the disaster at the most heavily affected area
- To provide a sacred place for requiem, peace and reconciliation among the different ethnic groups

2) Project Components

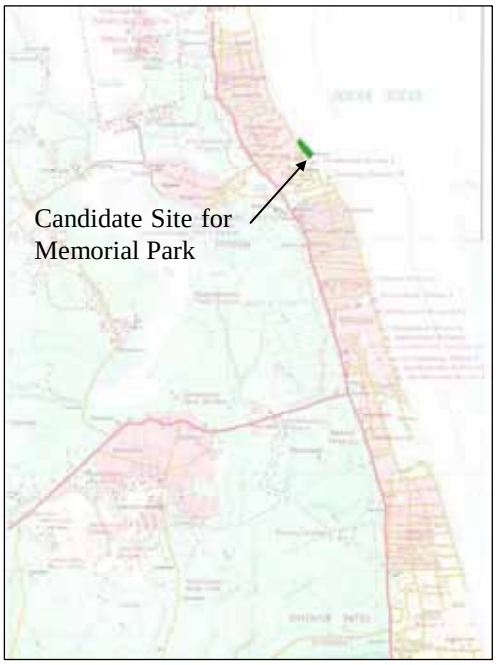
Tsunami Memorial Park Project consists of three components.

a) Memorial Park Development

Site selection was made in due consideration of the following aspects.

- Unused land in the buffer zone
- National land
- Area where both Tamil and Muslim can access

Based on these criteria, the Kalmunai post office area is selected as shown in Figure 6.5.3. Land extent is approximately 40 acres (16 ha). Boundaries confirmation and land transfer procedures to responsible organization are under process.



Source: JICA Project

Figure 6.5.3 Location of Memorial Park

b) Memorial Plaque for Commemoration of Victims

Plaque will be designed carefully to console all victims including Sinhara, Tamil, Muslim and will be placed on the memorial park.

c) Anniversary Requiem Ceremony

An anniversary ceremony is planned to be held at the memorial park annually to help

console those victims jointly with different ethnic groups

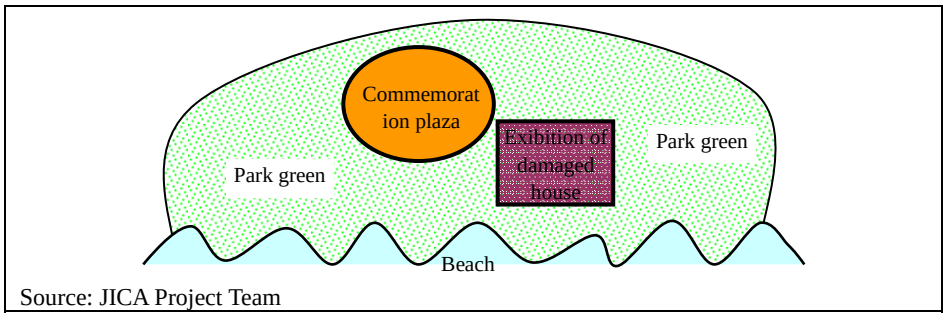
Concept Plan for Development

Construction of various facilities is proposed in the memorial park including car parking space, rest space, green, exhibition (museum) and preserved damaged house. Concept Plan is shown in Figure 6.5.4 and 6.5.5. The layout and facilities will be further revised on the basis of the agreement of the community and the related stakeholders.

Table 6.5.6 Project Components of Memorial Park

Project Component
Damaged House Preservation with Exhibition
Commemoration Plaza with Plaque
Infrastructure such as Road, water supply, electricity supply
Vegetation, etc.

Source: JICA Project Team



Source: JICA Project Team

Figure 6.5.4 Conceptual Layout of Kalmunai Tsunami Memorial Park

Figure 6.5.5 Image of Preservation of Damaged House

(5) Sewage and Night Soil Treatment and Disposal

1) Background and Needs

The sewage treatment and disposal improvement plan for the year 2030 is 1) to provide septic tank converted from cess pits, and 2) to establish the night soil treatment plant to dispose night soil and sludge from the septic tanks.

The construction of the septic tanks and/or conversion from the cess pits should be carried out systematically by preparing suitable time schedules considering the huge number of tanks required in the Kalmunai township area. Since the residential houses have been constructed within a narrow and congested area and are not easy to reconstruct, community septic tank or community plant will be beneficial for the use by several households at one time.

The night soil treatment plant is required for disposing the sludge from the septic tanks. Because of the number of households in the Kalmunai Township, a sizable land area should be acquired at the time of land acquisition for the treatment facilities.

2) Plan of Night Soil Treatment Plant

The location of the night soil treatment plant is proposed in the suburb of Ampara Municipality as shown in Figure 6.5.6. The basic plan is presented below.

- Service population: approximately 90,000

Table 6.5.7 Projected Service Population of Night Soil Treatment Plant

	2001	2010
Present Population of KM	94,457	
Projected Population of KM		114,000
Service population of night soil treatment plant		90,000

Source: JICA Project Team

- Project components: construction of night soil treatment plant and procurement of 11 gully suckers

- Development cost: Approximately US$ 1.5 million

Two night soil treatment plants are under construction with the non-project grant aid of Japanese Government at Batticaloa and Hambantota respectively. Following these models, the night soil treatment plant is to be constructed in Kalmunai by 2010.

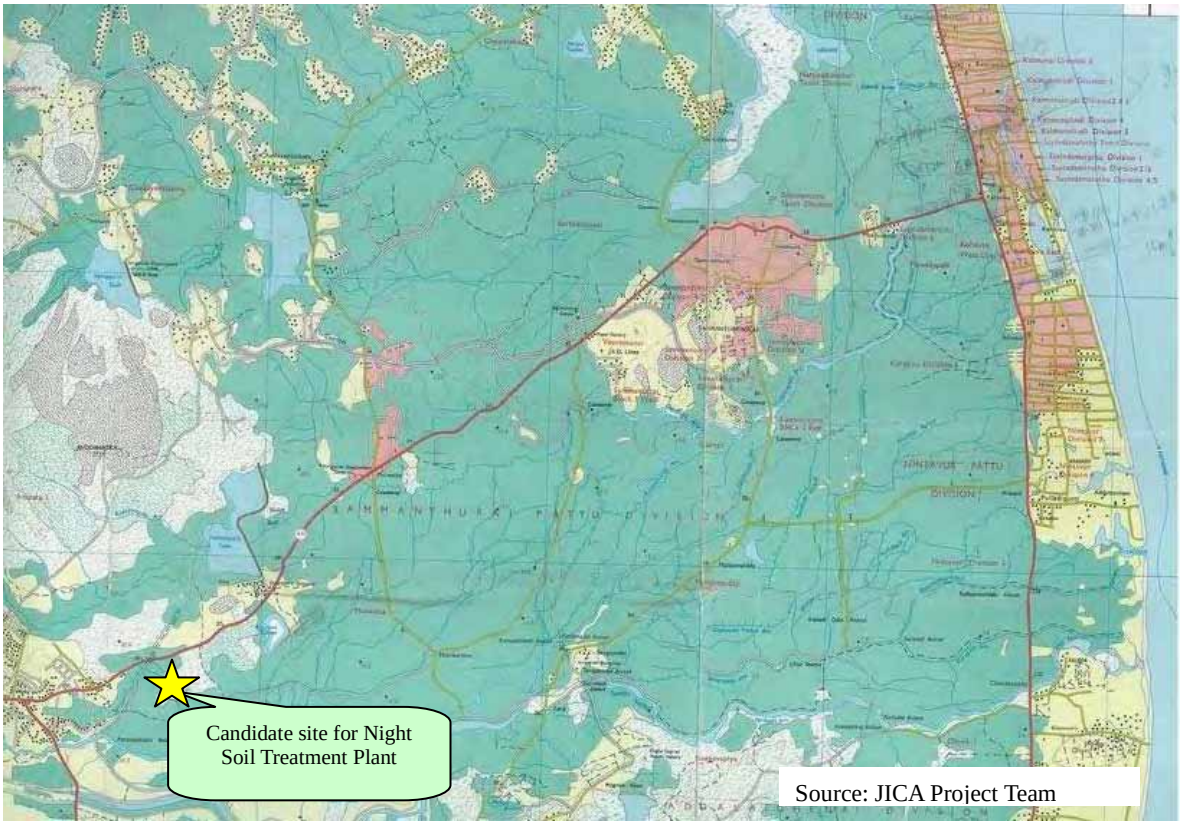


Figure 6.5.6 Location of Proposed Night Soil Treatment Plant

(6) Water Supply

As mentioned in 6.4.2 Infrastructure Development, the Phase III scheme of the Kalmunai water supply project has been already amended by NWSDB. However, the feasibility lacks coordination with the previous Phase I and II schemes and current ongoing projects proposed by FINIDA and DANIDA. In addition, the policy and definition of the entire service area has not been clarified. Due to these reasons, the careful and comprehensive review work for the Phase III scheme is required.

Beside the above, the completion of the remaining Phase II scheme should be carried out as a priority project such as transmission from existing treatment plants – Bantarawadiya pump sump and Santamaruthu pump sump conducting 700 mm and 600 mm respectively. The implementation of construction of these pipes is proposed by FINIDA and DANIDA. If the official commitment on the improvement is made by early 2006, the construction will be completed in 2007.

In parallel with these conduction pipes, the distribution pipes of the Kalmunai Township are urgently necessary to supply water to the tsunami affected area.

Technical and financial supports are being provided by DANIDA. This extension and improvement works in the Kalmunai Township will be completed in 2007.

The projected population increase in Kalmunai municipality together with Nintabur DS is only 17,000 during 2005-2010. The expected demand increase can be fully covered by the current capacity of water production at the treatment plant in the Ampara township. Therefore, no additional facility is necessary up to year 2010 if the transmissions and distribution above are installed as scheduled.

6.5.3 Programme for Disaster Mitigation and Management (Programme 2)

(1) Flood Control and Drainage Improvement

1) Background and Needs

The Kalmunai township area has suffered from inundation, particularly during the rainy season, because of topographic configurations that the site is low lying area, approximately MSL+2.5m in average, on a permeable sandy soil surrounded by the Indian sea and swamps on the east and west respectively. The depth of inundation frequently exceeds more than 1.0 m and the flood gives negative impacts on socio-economy and environment in the area.

In order to solve this inundation problem, the storm water should be discharged efficiently by providing adequate size of drains.

2) Project Components

To drain the flood water, trunk drains shall be provided from the residential area to the lagoon on the west and to the Ocean on the east. Prior to the planning of the drainage scheme, the Kalmunai Township area is divided into three sub-drains, namely, Indian Ocean sub-basin, lagoon sub-basin, and Santhamaruthu sub-basin on the basis of the preliminary survey data conducted during the project investigation. Outline of the sub-basins is as presented in Figure 6.5.7.

Using the division, structural measures for the drainage of the sub-basins are proposed as presented below.

i) Indian Ocean sub-basin

• Box culvert	2,000 x 2,000	200 m
	1,500 x 1,500	200 m
	1,000 x 1,000	200 m
• Manhole		15 units
• Outlet facilities		9 units
• Excavation machine with a house		2 units

ii) Lagoon sub-basin

• Box culvert	1,500 x 1,500	200 m
• Road cross section	1,500 x 1,500	12 m
	1,000 x 1,000	200 m
• Manhole		5 units
• Outlet facilities		20 units

iii) Santhamaruthu sub-basin

• Box culvert	1,500 x 1,500	200 m
	1,000 x 1,000	200 m
• Manhole		10 units
• Outlet facilities		9 units
• Excavation machine with a house		1 unit

(2) Disaster Management

1) Background and Needs

The importance of disaster mitigation and management has not been well recognized due to the limited experience of severe natural disaster such as tsunami, cyclone and earthquake. As a result, the Kalmunai municipality was severely affected by the tsunami of 2004.

Through the miserable experience, the importance of disaster management was recognized by community people as well as local stakeholders in Kalmunai. It is also identified that an emergency early warning system and community disaster management are to be developed as a priority project for comprehensive disaster management capability of Kalmunai municipality.

The priority projects to be implemented in Kalmunai municipality aim to improve disaster management of severe natural disaster.

2) Project Components

The following two project components are proposed to strengthen capacity development for community disaster management in Kalmunai Municipality.

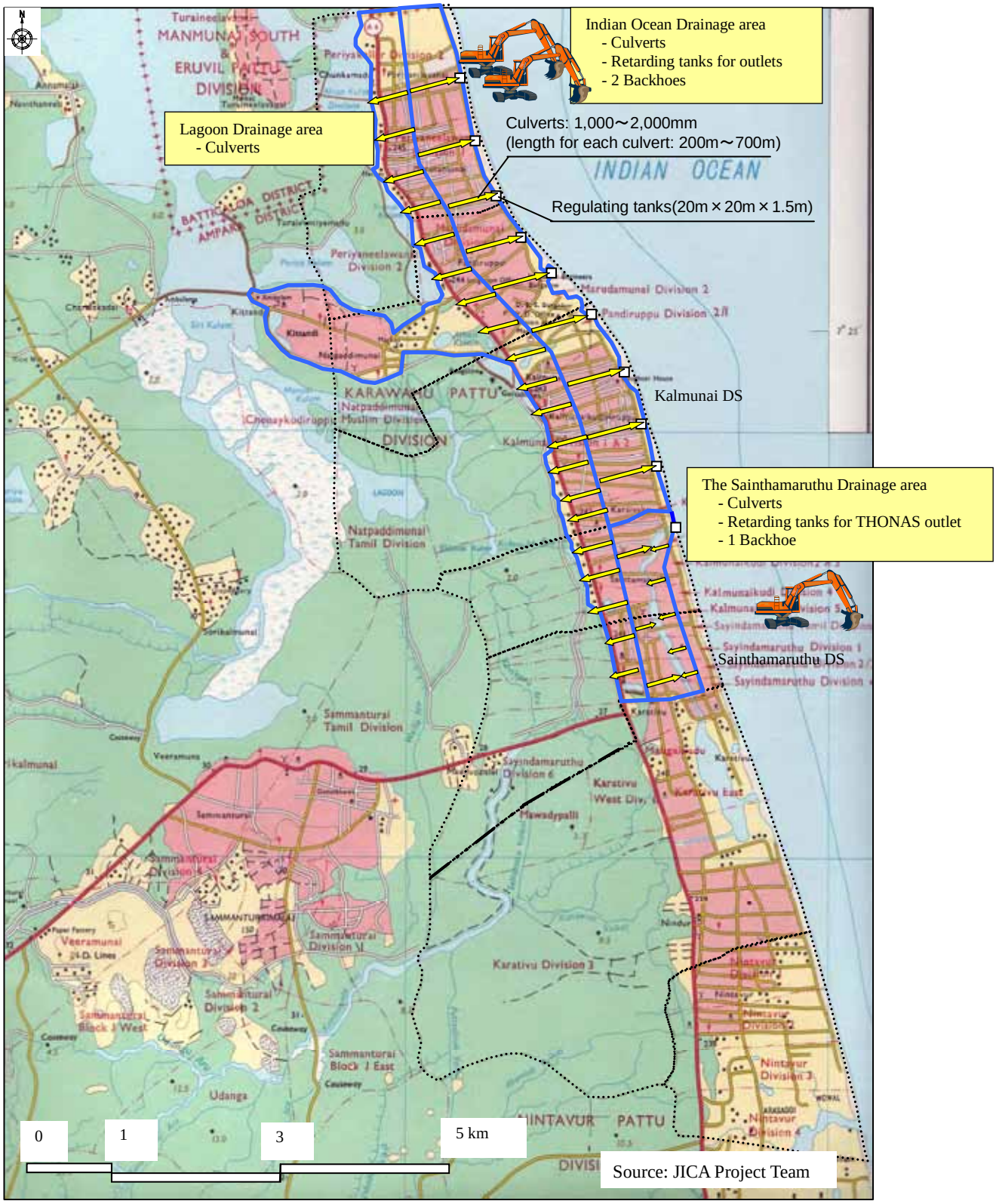


Figure 6.5.7 Location Map of Assumed Drainage Sub-basins

a) Establishment of Community Disaster Management System

Table 6.5.8 Establishment of Community Disaster Management System

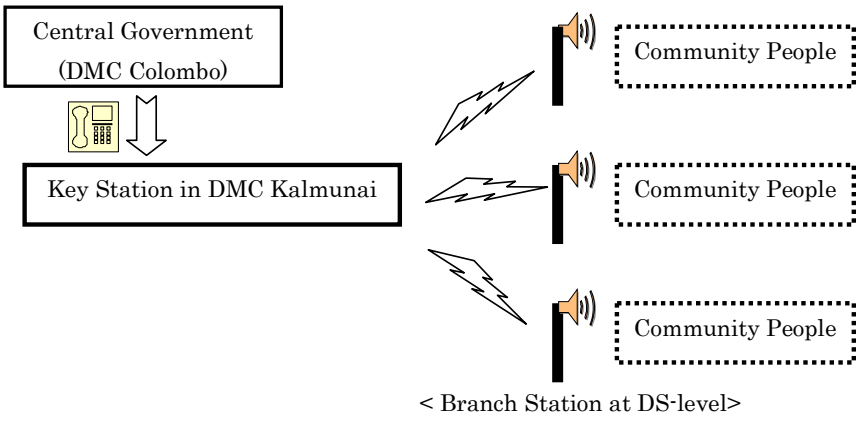
Objective	To strengthen capable of community disaster management in community-level
Activities	(i) Capacity development of disaster management for key persons such as local staff of the Disaster Management Centre (DMC) - to raise awareness of local DMC staff for disaster mitigation and management - to train local DMC staff for strengthening capability of community disaster management (ii) Establishment of a community disaster management system in pilot areas in due consideration of socio-cultural aspects - to conduct awareness campaign of disaster mitigation and management for community people - to train community people to strengthen capability of disaster management at the community-level - to conduct regular evacuation training at the community-level - to construct park and green belt with coconut trees to reduce the impact of tsunami and monsoon wave - to promote evacuation system through the improvement of the east-west internal roads - to establish evacuation centre in a commune place (iii) Diffusion of the community disaster management system to all the communities in Kalmunai - to diffuse every community on community disaster management by the trained local DMC staff
Inputs	- Dispatch of a long-term expert for community disaster management (3 years) - Dispatch of a few short-term experts for community disaster management - Construction of facilities on disaster management (evacuation centre, evacuation board, etc.)
Period	From 2006 to 2009

Continuous support is essential for realizing the sustainable disaster management at the community-level since it takes a long time to raise the awareness of disaster management.

b) Establishment of Emergency Warning System

Table 6.5.9 Establishment of Emergency Warning System

Objective	To establish a communication network for emergency early warning on natural disasters
Activities	(i) Planning and design of the VHF emergency early warning system (ii) Setting up the VHF emergency early warning system (iii) Capacity development of emergency early warning system for local staff of the Disaster Management Centre (DMC)
Inputs	(i) Facilities and equipment of the VHF emergency early warning system (ii) Dispatch of a short-term expert for emergency early warning system
Period	From 2006 to 2010



Source: JICA Project Team

Figure 6.5.8 Proposed Network of Emergency Early Warning System

Prior to preparation of the emergency warning system in Kalmunai Municipality, it is indispensable to prepare the national-level warning system which is closely connected with the international warning system such as the Indian Ocean Tsunami Warning Centre.

(3) Emergency Operation Plan for Emergency Response

1) Background and Needs

In disaster mitigation and management, disaster preparedness, especially formulation of emergency operation plan/contingency plan is important for increasing the preparedness to any natural disasters. In Kalmunai DPDHS office, an emergency response unit was organized already, however, any emergency operation plans have not been started. The lack of knowledge of emergency operation plans is the main reason for this delay.

2) Project Objectives and Target Area

The emergency preparedness and response project aims to establish an emergency operation system for any natural disaster at the municipality/divisional level. The project area is focusing on Kalmunai municipality, however, the nature of emergency operation is not always within the area of administrative boundary, and therefore, a hospital networking area will be the base of the project area.

3) Project Components

a) Formulation of emergency operation plan

At the district and divisional levels, both the mitigation plan and the emergency operation plan need to be formulated. In this project, the Kalmunai municipality emergency operation plan will be formulated. The process of formulating the emergency operation plan is as follows.

Table 6.5.10 Emergency Operation Plan Preparation Process

Process	Details
1. Write disaster scenario	Write scenarios of each natural disaster such as folds, landslides, drought, cyclones, tsunami, etc., in terms of the magnitude of damages and areas.
2. Identify necessary activities	According to the scenario, necessary activities to be taken for the disaster/emergency response need to be spelled out.
3. Identify relevant organization	Identify relevant organizations for disaster/emergency response, and decide who should be the leading entity for emergency operation and also the coordination mechanism among relevant organization needs to be spelled out.
4. Assessment of own resources	Make an assessment of own local resources, in terms of number of health institutions, human resources, transportation and drugs and medical commodity needed for emergency operation.
5. Identify Activities which is able to carry out own resources	With the locally available resources, the activities which are able to carry out locally need to be identified.
6. Consideration of mobilization method of external resources	The external resources need to be mobilized in order to carry out the activities which cannot be carried out by locally available resources. The mobilization and coordination mechanism need to be identified.

Conducting workshops will be the starting point for the series of discussion to formulate plans, and the DPDHS, which is the leading entity of whole emergency operation, is expected to organize workshops as described below.

Table 6.5.11 Workshops for DPDHS

Objectives of the Workshop	• Sharing the experiences of the tsunami Emergency Responses and Identification of Needs • Writing recommendations based on the needs identified • Understanding of the importance of contingency plans and understanding of steps/Procedures to formulate own Contingency Plan. • Reflecting the result to the District Health Development Plan and Kalmunai Township Redevelopment Plan
Workshop Organization	• 1st Workshop: Field level workers level (PHIs and PHMs) • 2nd Workshop: Head of Institutions level (hospitals and MOHC) • 3rd Workshop: Multi-sectoral level

b) Preparation of manuals for training

After formulation of a divisional/municipality level emergency operation plan, the disaster preparedness training including emergency response should be implemented. The training should include not only the health sector but also multi-sectoral agencies such as district disaster management unit, fire department, police, schools, electricity board, and others. Simple but comprehensive and practical manuals for disaster emergency operation should be prepared at the district level. The role and responsibilities, and system of the emergency operation need to be spelled out in the manual.

c) Drill/Training of Emergency Operation

It is recognized as important to have regular drill/practice to prepare for any natural disaster emergency operation. The drill/practice should be taken place at least once a year, by sectors, or with all sectors.

The drills/training schedule is as follows.

Table 6.5.12 Drill/Training Schedule

Drills/Training s	Organization	Years/Numbers
Formation of emergency operation team and training on emergency operation	All hospitals, All MOHC	2006
Actual Drills 1 by different scenarios	DPDHS, all hospital and all MOHC	Twice in each year
Actual Drills 2	■ DPDHS, all hospital and all MOHC ■ Other sectors related to emergency operation	Once in each year

6.5.4 Livelihood Restoration Programme (Programme 3)

(1) Activation Plan of Local Cottage Industry

1) Background and Needs

The last two-decades of ethnic conflicts which occurred in the Northern and Eastern Regions had given tremendous damages on local economy in the area. In particular, the local industries existed in the area had shown no development in the last two decades and people's motivation to challenge any new ideas for improving their

livelihood was completely stifled. The tsunami in December 2004 damaged various small scale local industries including local textile production existed along the coast.

Restoration of such small scale family-based industry is an important issue for the tsunami-affected people, and from the areal development point of view it would be important to encourage local industry to grow for the betterment of people's life.

Considering this situation, the project to activate the local industry was planned. The outline of the project is described as follows.

2) Project Components

On the basis of the experience and results of the pilot project, this priority project aims at the following objectives.

- To establish models of "Local Specialty Product" through the community initiatives
- To expand the activity of "community initiatives for prompting local products" and to improve the livelihoods of the people in Kalmunai municipality

Proposed project components are:

a) Selection of model products and establishment of "Local Specialty Product" models

This component includes the following activities.

- To organize local production activity groups and provide training on entrepreneurship
- To assess consumer needs and market needs by the groups
- To select model products through assessment of existing local products
- To explore the idea of new local products based on research of local materials
- To establish the business model through test production and marketing

b) Establishment of the distribution and marketing system

This component includes the following activities.

- To identify local trading entrepreneurs to be involved
- To develop the market strategies and logistics for selling local products among traders with the "Local Industry Promotion Office"
- To develop advertisement strategies and information dissemination strategies together with the "Local Industry Promotion Office"

c) Establishment of the "Local Products Promotion Office" for supporting community initiatives

This component aims to establish an office for promotion of local products and the functions of the office would be as follows.

Functions:

- Marketing, advertisement, and dissemination of information
- Training of human resources
- Promotion of product
- Coordination between producers and traders
- Micro-crediting
- Procuring of equipments and materials for production

(2) Pilot Project for Activating Local Industry

To verify the viability of activating local industry and to introduce practical activation programme, a pilot project was implemented as presented below.

1) Objectives and Components

The objectives of the pilot project are: 1) to verify the community co-assistance to improve their livelihood by activating and developing local industry using locally available natural resources, 2) to promote the livelihood rehabilitation by community empowerment and through coordination with local government assistance.

Project components consist of:

a) Formation of activity groups;

b) Selection of target products using locally available materials; and

c) Trial production and pre-marketing.

Three working groups were formed in three targeted communities of Kalmunai Tamil DS, Kalmunai Muslim DS and Sainthamaruthu DS. These groups have identified respective local products as shown below, under the supervision of NGOs.

Table 6.5.13 Activity Groups of Pilot Project

Group name	Supervising NGO	No. of Members
Kalmunai Tamil DS	CADERPU	8
Kalmunai Muslim DS	Maruthamunai Development Company	7
Sainthamaruthu DS	Al Ameen Community Development Centre	8

Source: JICA Project Team

Selection of the products for activating local industry was made on the basis of the following principles.

- To use unexploited resources
- To produce value-added handicrafts
- To apply simple skills with the least investment

Products proposed in the three groups are summarized in Table 6.5.14 and illustrated in Figure 6.5.9.

Table 6.5.14 Identified Products by Pilot Project Group

Material	Group	Activity contents
Palm fibre	Group 1 : Kalmunai Tamil DS	Utilize fibre of coconut and palm leaves taken from the palm trees planted in the buffer zone to make handcrafts with the figurative skills, which is inherited in Tamil culture.
Water-Hyacinth	Group 2 : Kalmunai Muslim DS	Produce handicrafts by making use of the existing weaving skills with the fiber of water-hyacinth grown largely in marshes.
By-product of fish	Group 3 : Sainthamaruthu DS	Cooperate with local fishery households of Santhamaruthu DS and produce handicrafts utilizing fishery by-product, i.e. fish scales.

Figure 6.5.9 Identified Products and Their Resources

2) Activities and Achievements

Orientation workshops were conducted initially by JPT, followed by technical assistance by NGOs. Activities of trial production continued up until February 2007. During the implementation of the pilot project, various problems surfaced and actions for solution were taken by each production group assisted by NGO as presented below.

Group 1 :Kalmunai Tamil DS

	Problems	Solutions
1	Intended to utilize fiber taken from the core of palm leaves which can be collected from the palm trees planted in the buffer zone. However, it was found out that extracting fiber from leaves would take too long for the short Pilot Project.	Purchased brushes (coconut fiber) to make handicrafts.
2	Purchasing brushes as materials to make handicrafts resulted in increasing the product price.	A company producing brushes for export supplied their irregular products free of charge. Seek to cooperate with this company in future.

Group 2 :Kalmunai Muslim DS

	Problems	Solutions
1	Large water-hyacinths to make bags etc. are difficult to collect during the dry season.	Produce of small size products, such as coasters, to make use of small water-hyacinths.
2	Personnel cost for collecting water-hyacinths is high.	The irrigation office is eliminating water-hyacinths on a set-up budget to maintain irrigation function. Intend to team up with the company which is operating the elimination, and get the materials at a low cost.

Group 3 :Sainthamaruthu DS

	Problems	Solutions
1	The smell of fish scales still remains in products.	Succeeded in building a method to eliminate the smell of fish scales after several trials and errors.
2	Scales became unavailable free of charge, and need to be purchased now.	Seek cooperation with fishery markets etc, to get scales free of charge.

In parallel with the production activity, efforts have been made to present them to various exhibitions sponsored by RADA, MOHC and other related organizations to verify the marketability and a sound future distribution channel. The following photos present actual performance during the exhibitions.

Participation in Exhibitions

Environment Exhibition and Trade Fair in Sri Lanka,
28-30 July 2006
At BMICH

Tokyu Department Store Tokyo
2-8 November 2006
at Tokyo Japan

Handicraft Exhibition: Beyond the TSUNAMI
sponsored by RADA and JICA
31st January – 27th February 2007
At Katunayake International Airport

Launch of Divisional Livelihood Development Plans of
35 Tsunami Affected Divisions in Sri Lanka sponsored
by RADA
9th November 2006
At Cinnamon Grand Hotel

Handicraft Exhibition
sponsored by National Craft Council
18th – 21st August 2007
At in National Art Gallery

Handicraft Exhibition
sponsored by National Craft Council
18th – 21st August 2007
At in National Art Gallery

3) Evaluation of Pilot Project

While the technical inputs from JPT ended by February 2007, the groups kept on working with their activities and the JPT, though limited, have carried out some follow-up activities. Evaluation of this pilot project is made with respect to the targeted objectives.

a) Effects to community empowerment

In each of the working groups, trial production has been made by establishing a

collaboration system from the stage of collecting resource materials, design of the products and the fabrication stage. To prepare for the exhibition of the products, further collaboration among the working group was promoted. Through this process, lessons and knowledge of quality production are accumulated in each working group and community empowerment was facilitated. The groups are still in action, though with some ups and downs in the levels of their activities, and continue to try to improve their products as well as to try opening the markets.

b) Effects to cooperation between public and community

Prior to implementing the pilot project, sub-committees were formed under District Committee of KTRP. From the stage of formulation of this pilot project, District Offices have been involved in the selection of working groups and the activities were implemented in each District. In the succeeding stage, District Offices assisted promotion activities including introduction of exhibition held in Colombo. For further marketing of the products, another exhibition was held under the leadership of RADA. To strengthen marketing and promotion of this activity, an exhibition named “Beyond the TSUNAMI” was held at Katunayake International Airport sponsored by MOHC and RADA. Through these activities, cooperation between government organizations and the community was enhanced and the fact that the cooperation gave benefits both to the government and community was confirmed.

Even after the project support finished, the groups were able to exhibit their products in the exhibition held by National Craft Council (NCC) in Colombo in August 2007, and is expected to join another exhibition to be held in November by Ceylon Industrial Board. Moreover, NCC started its support for the improvement of water-hyacinth handicrafts and held 4-day training in Kalmunai. Sri Lanka Handicrafts Board (LAKSALA) is also ready to collaborate with groups, as they are to be registered with LAKSALA and are waiting for the good samples from groups to issue the purchase order. These developments further prove that public and community cooperation is continuing.

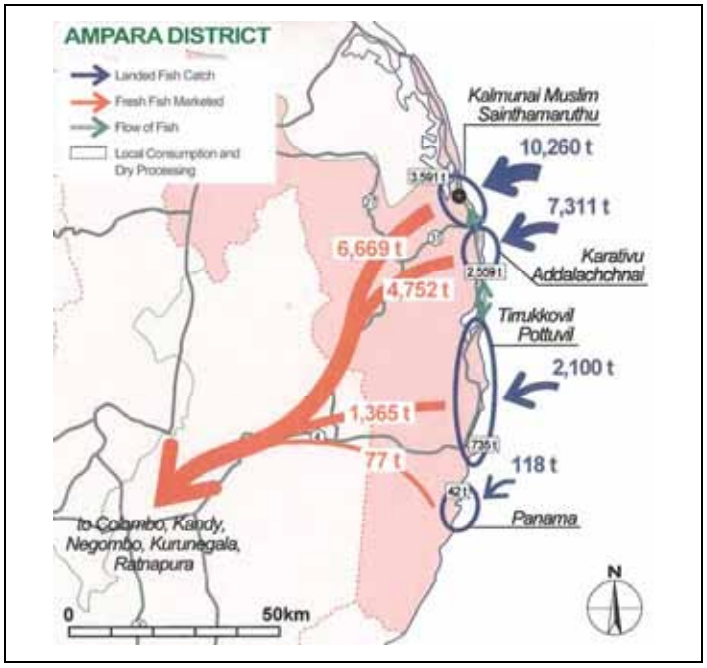
c) Effects to cooperation among different ethnics

Activities to encourage cooperation among different ethnics started from the stage of seminar and workshops introducing quality improvement and marketing. Through these activities, technical transfer for producing handicrafts and integrating products of other groups were facilitated. Importance of the cooperation and merits from the cooperation were recognized in each ethnic group.

(3) Fishery Activation Plan

1) Background and Needs

Almost 50% (10,000 tons) of marine fish production in Ampara are landed in Kalmunai and Sainthamaruthu. It is reported that about 10 tons/day of fresh fish are collected and distributed from Kalmunai and Sainthamaruthu (including fish catches from Pottuvil).



Note: Fish landing figures refer to 2004 provisional data from MFAR
Source: March –July 2005, JICA Project Team

Figure 6.5.10 Fish Marketing Pattern and Flow in Ampara District

The fish landing sites of the district are also scattered along the coast and main marketing activities are concentrated in around Kalmunai and Sainthamaruthu.

There are no on-land functional facilities catering to marketing needs, except for private owned fish handling sheds along the beach (see Photo. 6.4.3). There were supposedly around 150 such sheds before the tsunami, which were all destroyed by the tsunami. As of November 2005, around 65 sheds have been restored temporarily.

Photo 6.5.11 Fish Handling Shed Restored after the tsunami

Most of the stakeholders in the fishery sector are eager to develop deep sea fishing through the introduction of multi-day boats. A fishing port is necessary to develop deep sea fisheries. However, Ampara has long sandy beaches and has no appropriate area for port development.

The other problems and needs confirmed through the field surveys are as follows:

- No fish collection facility in Kalmunai and Sainthamaruthu. Hygienic condition of fish handling sheds owned by individual traders is very poor.
- Some high market value fish catches are not considered for export due to quality reason.
- Since fish transportation system is well developed in Kalmunai, most of the catch is sold fresh, and thus, only few traditional processing activities are carried out in the area.
- Women's work in the community is limited to fishing gear making and repairing, but it is still small scale and not organized.

2) Objective

This project aims to improve the income level of fishers though the strengthening of marketing and other fisheries- related activities. The concept of the pilot project is as presented below.

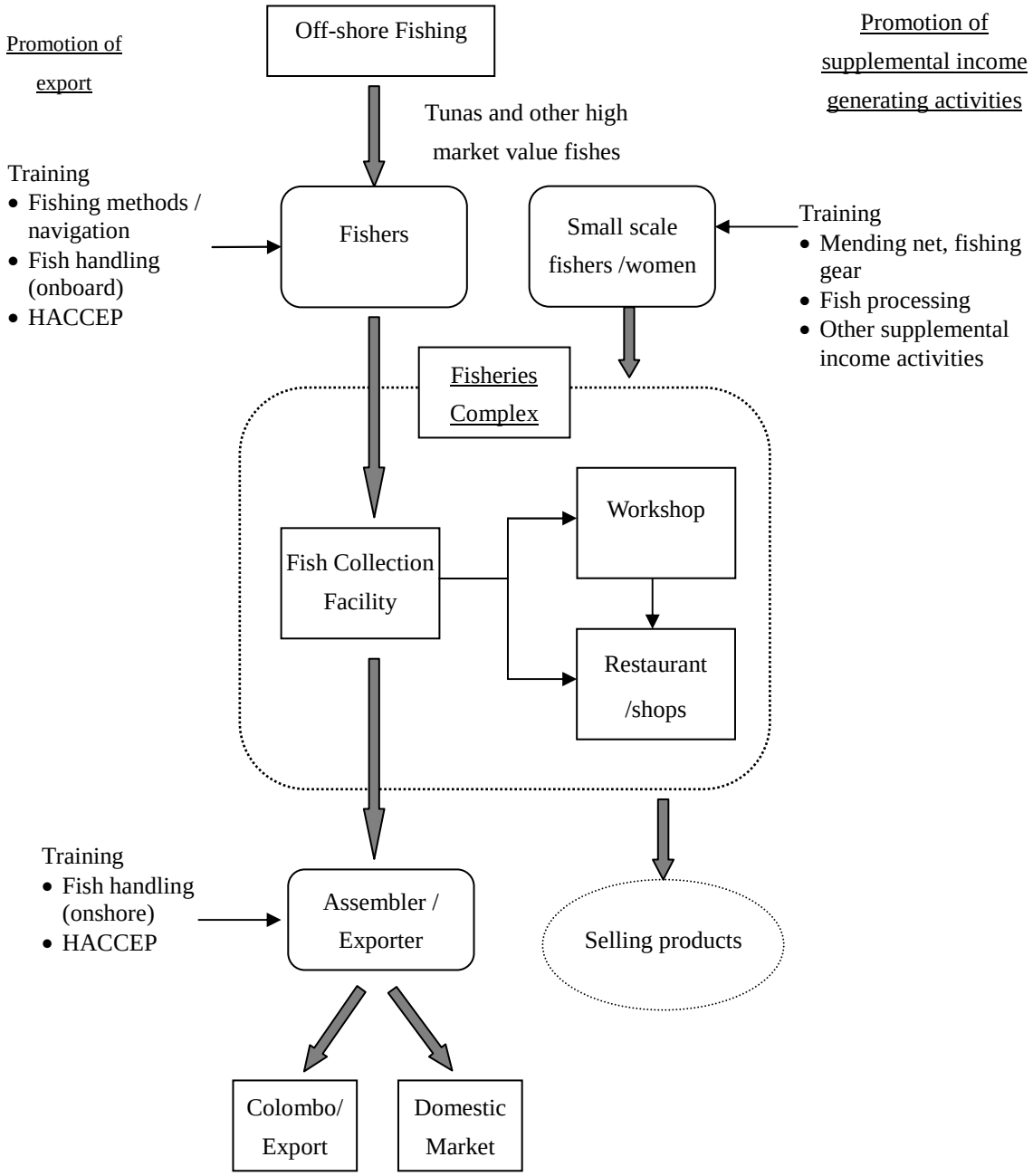


Figure 6.5.11 Concept of Fishery Priority Project

3) Project Component

The project will include three components, namely i) establishment of fisheries complex, ii) promotion of export, and iii) promotion of supplemental income activities.

Establishment of Fisheries Complex

Fisheries complex consists of fish collection facilities, workshop and shops for

following purpose:

- Fish collection facilities: Exportable fishes are collected in the fish collection facilities for handling and packing under hygienic conditions. The facility includes ice storage, handling, icing and packing space.

- Workshop: Workshops will be used for training for income generating activities such as net making, fish processing, and working place for the FCS members involved in the activities.

- Shops: Provide places for operating small business for FCS members. Some items produced by the income generating activities will be also sold at the shops.

Promotion of Export

According to fish exporter in Negombo/Colombo, fish transported from the eastern region including Ampara are rejected due to low quality. Therefore, the project will provide necessary training for improving quality of tuna and other high marketable fish for export purpose. Contents of the trainings are as follows:

- Training for fishers: Off-shore line fisheries with introduction of training equipment such as long line, GPS, compass, FAD. Onboard fish handling methods such as brain spiking, bleeding, and histamine control of tuna by icing, etc.

- Training for traders: fish handling/transportation methods and HACCEP.

- In addition, financial capacity of FCS is strengthened to enable fishers' access to equipment for off-shore fisheries.

Promotion of Supplemental Income Activities

Assist fisheries societies with feasibility studies to assess viability of identified value adding commercial opportunities, especially for women household members associated with fishing e.g. fish processing, net mending, and off-fishing business.

This component will include following inputs and activities:

- Identifying supplemental income activities.

- Training for transferring necessary skills

- Promotion of supplemental income activities such as fish processing, net mending

and repair, etc.

- Strengthening financial support system such as micro finance and loan scheme of FCSs

The project targets FCSs in Sainthamaruthu, and the facilities aforementioned is constructed next to the fish market that GOAL plans to construct in Sainthmaruthu.

6.5.5 Cost Estimate

For the implementation of the priority projects for Kalmunai Township Redevelopment proposed hereinbefore, the required cost is estimated preliminarily at approximately US$ 36 million as shown below.

Table 6.5.15 Summary of Priority Projects of Kalmunai Township Redevelopment Plan

	Item	Cost (million US$)
I. Restoration Program for Urban Environment		**14.1**
1)	Road network redevelopment (Intra-city road (Route A31), Kalmunai internal	3.4
2)	Debris clearance	1.8
3)	Urban amenity improvement in Thonas	7
4)	Memorial park	0.4
5)	Night Soil Treatment Plant, etc.	1.5
II. Disaster Mitigation and Management		**20.3**
6)	Flood control and drainage improvement	14.3
7)	Disaster management	6.0
8)	Emergency operation/hospital contingency plan	-
III. Livelihood Restoration		**1.5**
9)	Enhancement of local industry	0.9
10)	Fishing activation	0.6
Total		**35.9**
Total of 1) - 6)		28.4

Note: Engineering service, price and physical contingency are not included
Source: JICA Study Team

6.5.6 Progress of Implementation

The current progress of priority projects proposed hereinabove was reviewed and the related JICA study/plan is presented in Table 6.6.1.

Table 6.5.16 Progress of Priority Project

Priority Projects		Present progress		JPT Study/design
Urban Development and Management				
U-1	"THONAS" restoration by debris clearance, bank reinforcement, etc.	UDA is in charge; however no actual commitment has been made as of Dec. 2006.		Detailed plan of Thonas restoration is prepared by JPT.
U-16	Improvement of Internal Roads	Municipal Council is in charge Small scale rehabilitation of tsunami damaged roads is being implemented by JBIC.		Internal road network improvement incorporating with flood control is prepared by JPT.
U-17	Improvement of Main Roads (A4)	RDA is in charge. Rehabilitation of roads and bridges on A4 is being implemented by JBIC (JICS)		
(Utility)				
U-19	Water Supply System Expansion/Upgrading	Implementation by Australia ODA is in progress, 80-85 per cent achievement as of Dec.2006		
U-20	Storm Water Drainage System Improvement	French Red Cross (FRC)'s project identification has been in progress for a year; however no actual commitment has been made as of Dec. 2006.	→	Detailed plan of flood control is prepared by JPT.
U-21	Sewage Treatment System Improvement (Night Soil Disposal)	World Vision is studying (although no actual commitment as of Dec.2006).		PP by JPT should be replicated.
U-22	Dumping Site Development for Garbage/debris and Solid Waste Management	USAID is studying (although no actual commitment as of Dec. 2006) CASP (Canadian Agro-Sustainability Partnership) has done a study and waiting for a DS's approval for (as a part of Ampara District Master Plan. Preliminary Master Plan was presented in Nov.2006)	→	Detailed plan is prepared by JPT.
U-23	Electricity Supply System Expansion/Upgrading	Rehabilitation conducted by CEB		
Disaster Management				
DM-1	Disaster Mitigation Training Knowledge Empowerment	DMC is in charge (No actual study/commitment has been made)	→	Disaster management plan should be incorporated with National Disaster Management Plan.

DM-2	Public Awareness System incl. Information Board, etc.	DMC is in charge (No actual study/commitment has been made)	→	Disaster management plan should be incorporated with National Disaster Management Plan.
DM-3	Plantation in the Coastal Buffer Zone	Projects are being implemented by GOAL, Sarvodaya, Neo Synthesis Research Centre (NGOs)		
DM-4	Tsunami Memorial Park / Museum development	UDA Kalmunai in charge (No actual progress)	→	JPT supported UDA
DM-5	Evacuation Plazas (Aid centre after disaster) development	DMC is in charge (No actual study/commitment has been made)	→	Disaster management plan should be incorporated with National Disaster Management Plan.
Economic Development relevant Facility				
(Fishery Industry)				
E-2	Boat Gear Storage Improvement	MOF is in charge	→	Integrated in Thonas detailed plan
E-5	Redevelopment of Transport Support Facility	Ice plant by JICS		
E-6	Fishermen Community Multi-purpose Training Centre	Construction is in progress by NGOs (GOAL, GVC etc)		
(Small Industry/Manufacture)				
E-8	Cottage Industry - Capacity Building	NGOs are in charge in some fields. Some capacity development projects are being implemented by GOAL, Sewa Lanka, USAID etc.	→	Pilot project of local product promotion from unused resource was done by JPT.
E-9	Strengthening of Handloom Industry	USAID/Sewa Lanka is implementing a project. It is also mentioned in Ampara Master Plan by CASP.		

Source: JICA Project Team

6.6 Preliminary Design of Priority Projects

6.6.1 General

Through the discussion with the KTR committee members, the following projects were selected from the priority projects for preliminary design.

- Flood control and road improvement
- Debris clearance and solid waste management
- Urban amenity improvement along Thonas
- Construction of a memorial park

6.6.2 Flood Control and Road Improvement

(1) Project Component

After reviewing the priority projects, the following road network consisting of two components, namely, (1) improvement of road network and (2) development of inundation free measures were selected for further study as summarized below.

Table 6.6.1 Project Component

Project Component	Sub-project
1. Improvement of Road Network	1) Improvement of 15 major internal roads 2) Side drains along the roads 3) Crossing culverts in the coastal road to drain water from the side drains above 4) Improvement of coastal road
2. Development of Inundation Free Measures	1) Side drain along the coastal road 2) Side drains along and crossing culvert through the A4 road 3) Improvement of A31 road

Figure 6.6.1 outlines the improvement of road network and development of inundation free measures.

(2) Improvement of Road Network

It was planned to improve the internal roads, connecting A4 road in the west and coastal roads in the east, so as to formulate the northern and southern edges of the

target area. The coastal roads will also be improved as one component of the road improvement.

Major Internal Roads

The following 15 internal roads were selected to be improved.

Figure 6.6.1 Location of Road Network Improvement/Flood Control Project

Table 6.6.2 Internal Roads to be Improved

No.	Name	Length (m)*1	Width (m)*2	Administration*3
1.	V.C. Road	1,050	4.5 to 8.8	KM
2.	Mashoor Road	1,155	4.9 to 9.9	RDD
3.	Pullayar Road	1,129	3.6 to 8.2	RDD
4.	Talawadduvan Road	1,140	4.5 to 9.9	RDD
5.	Rest House Road	1,250	7.5 to 16.0	RDA
6.	Cemetery Road No.k-32 & Quarry Road K-29*4	910	Xx to xx	RDD
7.	Uddayar Road	1,330	4.6 to 11.4	RDD
8.	Tharavu Road	1,116	Xx to xx	RDD
9.	Sahibu Road	1,094	3.7 to 6.5	KM
10.	Zahira College Road	1,160	5.1 to 7.5	RDD
11.	Mawadi Road	1,100	2.9 to 10.6	KM
12.	Al Hilath Road	1,133	4.0 to 8.5	RDD
13.	Karativu - Sainthmaruthu Road	1,085	4.1 to 12.5	RDD
14.	Central College Road	1,000	Xx to xx	RDD/Karutive Pradrshia Sabas (PS)
15.	Palayadi Pillar Kovil Road	1,033	5.0 to 12.5	Karativu PS
	Total	16,685		

Source: JICA Project Team
*1: Length shows the distance between A4 road and coastal roads, based on the survey by the Team.
*2: Width means the carriageway, or the width between houses where inhabited densely.
*3:KM: Kalmunai Municipality, RDD: Provincial Road Development Department, RDA : Road Development Authority

Coastal Roads

Coastal roads will also be improved to serve as the evacuation and maintenance road, which connect the end point (EP) of the 15 roads selected above:

Table 6.6.3 List of Coastal Road

No.	Between EPs of the Following:	Length (m)
C-1	V.C. Road to Mashoor Road	918
C-2	Mashoor Road to Pullayar Road	682
C-3	Pullayar Road to Thalawadduvan Road	900
C-4	Thalawadduvan Road to Rest House Road	594
C-5	Rest House Road to Cemetery Road K-32 & Quarry Road K-29	306
C-6	Cemetery Road No.K-32 & Quarry Road K-29 to Uddayar Road	1,150
C-7	Uddayar Road to Tharavu Road	384
C-8	Tharavu Road to Sahibu Road	466
C-9	Sahibu Road to Zahira College Road	756
C-10	Zahira College Road to Mawadi Road	411
C-11	Mawadi Road to Al Hilath Road	525
C-12	Al Hilath Road to Karativu-Sainthmaruthu Road	238
C-13	Karativu-Sainthmaruthu Road to Central College Road	647
C-14	Central College Road to Palayadi-Pillayar Kovil Road	973
	Total	9,950

Source: JICA Project Team

(3) Development of Inundation Free Measures

To make the roads and residential areas in Kalmunai Municipality inundation free during the rainy season, a drainage facility plan was prepared based on the NWSDB design standard. It is planned to drain storm water with rainfall intensity of 60mm/hour (5-year return period).

Figure 6.6.2 shows overall drainage plan, and briefly explained below.

The storm water in the area is planned to drain to the Indian Ocean through coastal roads in the east (east drainage) and to the irrigation drainage channel in the paddy field in the west (west drainage);

(East Drainage)

The storm water will be led to the drainage to be newly constructed and finally drained to the Indian Ocean crossing the coastal road in the improvement of internal road network;

The new drainage system, running along the coastal road, plans to have a box culvert section of 100cm (d) x 150m (w).

(West Drainage)

The storm water will be led to the irrigation drainage channel in the paddy field through the drainage channel to be newly constructed along the A4 road;

The existing 16 culverts are to be utilized and three existing one will be renewed with larger sizes.

(Drainage Facilities other than these 15 Roads)

There are many roads connecting the A4 road and the coastal road as well as streets connecting the above roads;

Improvement of these roads/streets is being partly implemented by such international organizations such as French Red Cross (FRC), UNDP, GOAL, North-East Coastal Community Development Programme (NECCDEP). Further coordination is required to develop them as inundation free ones under Kalmunai Municipality.

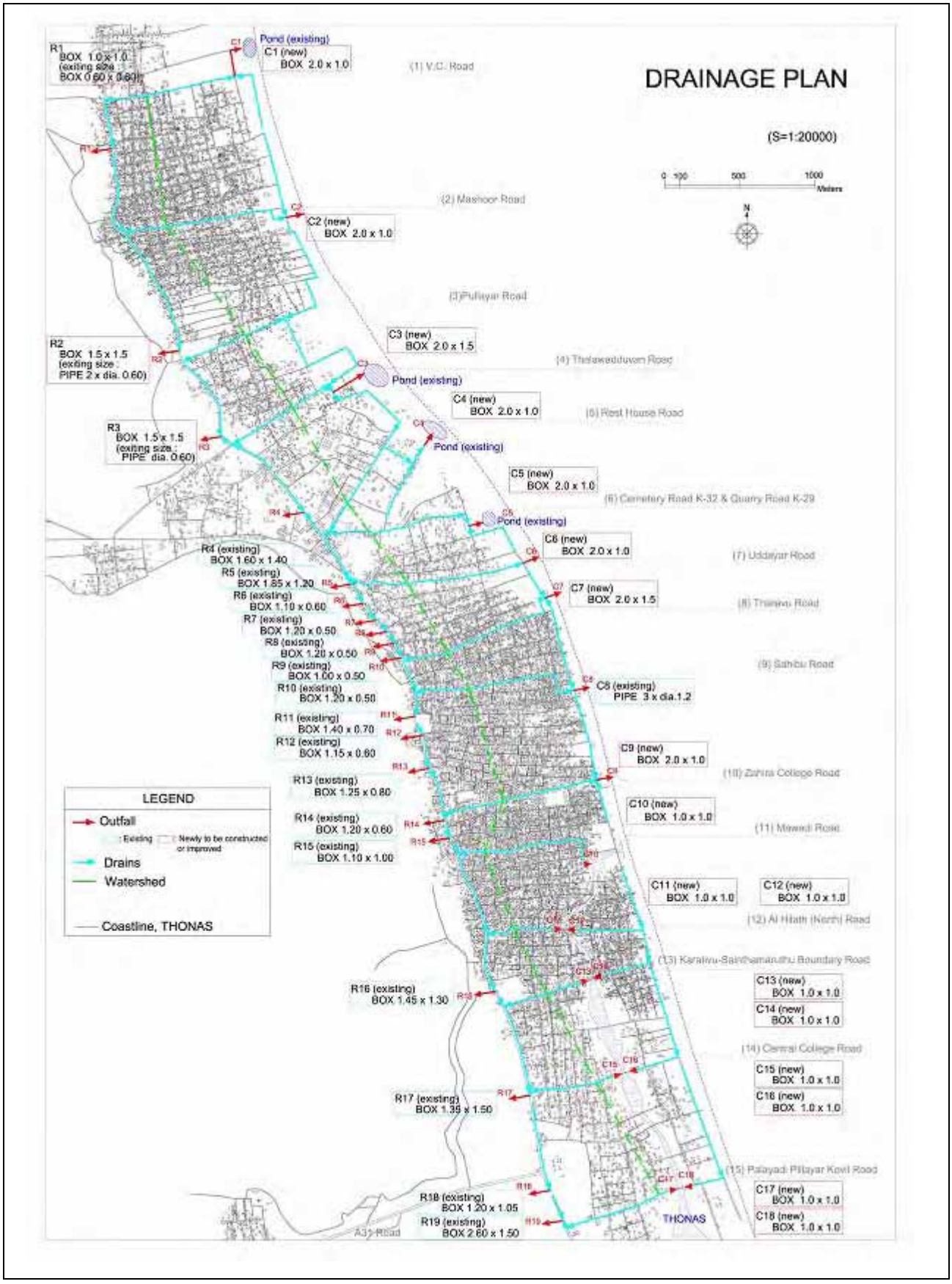


Figure 6.6.2 Overall Drainage Plan of Kalmunai Municipality

(4) Heightening of Inter-City Road (A31)

Part of the A31 road (around 1.5kmfrom the Karativu junction toward Ampara), has been submerged for two to three consecutive days in the rainy season. In this section, there are two bridges; one is one-lane (bridge No.1/1 with 4.3m effective width and length of 60.7m) situated at 535m from the Karativu junction toward Ampara, and the other is two-lanes (bridge No.2/1 with 5.3m and 57.9m) situated at 1,163m from the junction.

The first one-lane bridge causes traffic jams throughout the year, while the formation height of the second one is low and submerged during the rainy season.

To improve this situation, the following measures are planned, though no hydrological study has been conducted due to the complicated situation in the upstream area:

1) Heightening of Low Lying Road Section

Raising the height was set at the same elevation as that of two-lane bridge (No.2/1), considering the submerged condition during the rainy season as explained below. To discharge the flood water during the rainy season, crossing structures of box culverts (23 nos. 2.0 m wide x 1.0 m high) are planned to be installed in the raised embankment.

2) Widening Bridge No.1/1 from One-lane to Two-lanes

The existing one-lane bridge has a width of 4.3 m, which causes traffic jams not only during the traffic peak hour in the morning and evening, but also daytime. To improve this situation it should be widened from 4.3 m to 5.5m. An additional one lane will be constructed and combined with the existing one after demolishing of the handrail on the downstream side.

3) Heightening floor slab of bridge No.2/1

The elevation of the top slab of the existing bridge is only El.2.516 having a little clearance even during the dry season. During the rainy season, the flood water overtops by 30 cm (El. 2.816). To improve this situation, it is planned to demolish the existing bridge and to construct a new bridge raising the top slab up to El.3.416 m or height of 1.2 m. The width of the existing bridge is 5.3m, which is also widened to 5.5m following other bridges under management of RDA.

Raising the existing road embankment of A31 as described above will cause problems for irrigation water crossing the road. To solve this, a crossing structure of culverts is

planned. For the planning, river discharge during rainy season was calculated under the assumptions of hydraulic characteristic of the irrigation canal such as roughness coefficient (n = 0.05) and hydraulic gradient (1/5,000).

(5) Cost Estimate

The cost for improvement of internal road network, and flood protection and drainage improvement is estimated at USD 17.7 million as presented below.

Table 6.6.4 Project Cost Estimation

No.	Project	Sub-programme	Estimated Cost (US$ million)
1	Preliminary Work		**0.60**
2	Improvement of Road Network	1) 15 major Internal Road	0.44
		2) Coastal Road	2.36
		Subtotal (1)+2))	**2.80**
3	Development of Inundation Free Measures	3) Drainage Facility along Coastal Road	5.43
		4) Drainage Facility along the internal road	5.40
		5) Improvement of Intra-City Road (A31 Road) - Raising of Lower Section - Raising of Two-Lane Bridge - Widening of One Lane Bridge Subtotal (5))	 2.61 0.71 0.19 3.51
		Subtotal (3) to 5))	**14.34**
		Total (1+2)	**17.74**

Source: JICA Project Team

The time needed for implementation of the road network and the work for inundation free measures is planned as follows:

i) Drainage facility in the total area of east drainage: 2 years
ii) Drainage facility in the total area of west drainage: 2 years;
iii) Improvement of A31 road: 1 year

6.6.3 Debris Clearance and Solid Waste Disposal Management

Site Selection

Four potential sites are reviewed for the landfill site as presented in Table 6.6.8. The first one at Oulvil is technically a good site but far away from Kalmunai. There are plenty of raw materials for landfill site construction however it is also within 1km or so from a planned tsunami rehabilitation village. Besides, CEA officer reported that the local population is very resistant to the development of a landfill at this location.

The second possible site has better access, but again not owned by operator and located in a difficult security area between GOSL and LTTE controlled areas. This site is only 8km from Kalmunai, closer than Oulvil. There are two other sites at Islamabathand Sammanthurai, but KMC advised that they do not wish to proceed with either of these two locations.

Table 6.6.5 Comparison of Potential Landfill Site

Landfill Site	Disadvantages	Advantages
1) Oulvil South of Area Option proposed by CASP for initial landfill cell	Nearly 25 km from Kalmunai Very poor road from A4 (Although is used by gravel trucks), if used for landfill site over longer period would require considerable upgrading of road and at least one bridge. Close to river which runs to environmentally sensitive area Population resistant to landfill Proposed location for tsunami rehabilitation village	Close to sources of aggregate, sand and clay , important materials in landfill construction Area is government owned land and therefore likely to be less expensive Good technical area
2) Charalakadai North of Area PREFERRED OPTION BY KMC	Sensitive political area, between GOSL and LTTE Private land, likely to be more expensive (amount) About 200 mainly Tamil families in area, but advised that this is not a problem depending on community involvement from early stage.	Much closer to Kalmunai, only 8km Road generally better quality and less track Precedent for landuse has been set by small wastewater works being developed at location by NGO Materials for landfill construction also seem to be available at this location
3) Islamabath Upgrade Current Dump Site	Not an option due to land ownership issues Also close to the sea and possible risk of tsunami strike Discarded by KMC	n/a
4) Sammanthurai Small current site for upgrade	Discarded by KMC	Close to Kalmunai

Source: JICA Project Team

Whilst it is not possible to select the site without further investigation and discussion with the stakeholders, the second one located near Charalakadai seems most appropriate.

(1) New Landfill Facility

Though the site selection is not yet finalized, basic design of the landfill facility is proposed as follows;

Table 6.6.6 Preliminary Design of new Landfill Site

Item	General Specification
Landfill Area	Year 2010: 2ha Year 2020 3ha Year 2030 3.5 ha – should be target, to ensure that recycling markets and other initiatives are not reduced Initially 3 cells/areas 1 for current waste dump site 1 for new Inert Waste should be used within site operations as much as possible, for example, bunding, daily cover, cell construction etc 1 cell for interim clinical waste disposal before incinerators becomes available) 3m deep fill including cover. (Total volume 70,000m3, assuming density of 0.7 provides) provides space for approximately 4 years @ 40 tons per day, but seek to reduce waste and composting will significantly increase expected life span.
Access Road	Upgrading of up to 6KM will be required for Oulvil Site, less upgrading will be required for alternative site
Storm Water Drains	1200m, these should ensure that excess leachate is not generated.
Liner System	Natural Clay Soil Layer and Synthetic Liner
Leachate Collection Pipes	PVC Perforated pipe with diameter of 200mm and 300m
Leachate Treatment Pond	Two evaporation pond and gas collection
Gas Collection System	Vertical vent and collection for reuse of gas or basic flaring/gas venting trenches
Fencing 300m	This is a minimum, may require more
Weigh Bridge	For 40t capacity including foundation and necessary equipment
Maintenance Workshop and administrative building	Building of approximate proportion of 10mx10m also require cooking facility and toilet/bathroom and shower area. This is important if accident at site and staff need to wash
Utilities	Electricity, water and telephone access will be required
Hazardous Waste Storage Area	Bunded with concrete base and drainage system
Weighbridge and Wheel wash	Weighing equipment should be installed as should wheel wash facility

Source: JICA Project Team

(2) Cost Estimate

Implementation plan and cost estimate are as summarized below. Total cost including debris clearance is estimated at USD 1.8 million.

Table 6.6.7 Implementation Plan and Cost Estimate

Project Components	Amount (US$1,000)	Remarks
1 DIRECT COST		
1.1 Phase I Implementation	1,016	Collection System, Landfill Site, Leachate Treatment , Gas Treatment , Transfer of waste from Islamabath, Remediation of Islamabath, etc.
1.2 Phase 2 Implementation	288	Transfer/MRF Station, Composting Facility
1.3 Debris Clearance	53	Hazardous Waste Survey, Disposal of Hazardous Material, Demolition
2 INDIRECT COST	424	Land Acquisition Costs, Project Administration
TOTAL	1,781	

Source: JICA Project Team

6.6.4 Urban Amenity Improvement along Thonas

(1) Redevelopment Plan of Thonas

Based on the site survey and discussions with the local community, the following are to be implemented as essential elements and included in the programme for Thonas Redevelopment.

1) Clearing of all remaining debris in and around the lagoon, along the Thonas and at the beach.

2) Dredging of canal and lagoon to remove silt is imperative. In the initial phase a canal bed survey comprising cross sections at suitable intervals will be carried out. The improvement of drainage function will also be evaluated through mathematical modeling.

3) Solid waste disposal system will be introduced with an awareness programme.

4) From the landscape and recreational points of view, the following aspects are taken into account for planning and design:

   a) Visual integration of the Thonas into the fabric of the city.

   b) Redevelopment/new development geared to facilitating visibility of the Thonas such as preservation/creation of "window", linear views, sequences of views, vistas (in between/through built-form)

The proposed Thonas improvement plan is summarized in Figure 6.6.3.

<u>Lower Reach</u>

- Refilling of the over bank areas at the lagoon outlet and stabilization with bank protection measures such as gabion works. In this respect, the canal banks at the outlet up to about 40 m seaward of the bridge crossing should be installed. As the local community is not keen on maintaining a permanently open canal outlet, and also considering the adverse impacts of salinity resulting from an outlet opening throughout the year, a sea outfall structure appears to be not warranted at this stage.

- Provision of a quay inside the lagoon for unloading of fish catch and loading of supplies such as water and fuel. The layout and location of the quay will be finalized by consulting officials of Fishery Harbor Corporation. At this stage it is

envisaged that quay will be located adjacent to the bank protective works in the left bank of the lagoon.

- Construction of a fish auction hall adjacent to the quay.
- Construction of a Community Centre for the fishing community with facilities and space for conducting meetings, attending to net mending and also equipped with toilet and other sanitary facilities.
- Provision of a boat re-fuelling facility at the quay.
- Provision of an Ice Plant & fish market adjacent to the quay.
- Construction of a boat repair facility. This could be sited on the left bank of the lagoon away from other fisheries infrastructure facilities provided on the left bank.
- Provision of a channel harbor facility to anchor 600 boats during the monsoon season.
- Construction of restaurant/shops to cater to the local community as well as tourists.
- Provision of equipment for cutting sand bar.
- Provision of parking facility for vehicles coming from outstation to buy fish.

Middle Reach

- Development of waterfront residential area.
- Establishment of a 3 to 12 m wide linear park along most of the water's edge in the urban Thonas environment.
- Provision of a continuous pedestrian route as close to the lake as possible, necessary pedestrian vehicular links to main roads, housing schemes and commercial centres, a scenic drive in certain stretches and vehicular parking area in suitable locations.
- In urban area, greenery could be introduced wherever possible in such a manner that it could with stand expected use without high maintenance.

Upper Reach

- Provision of a protected wetland area, "nature" banks with protective mangrove (Ecosystem) to prevent erosion and/or destruction, vegetation buffer strips along

the shoreline (including Coconut and Palmyra trees)

- Provision of inland fishing, selected water-based recreational facilities, without conflicting activities.

- In conservation area and buffer zone, soil binding mangroves and ground cover plants could be used in order to create natural ecosystem and slope stabilization.

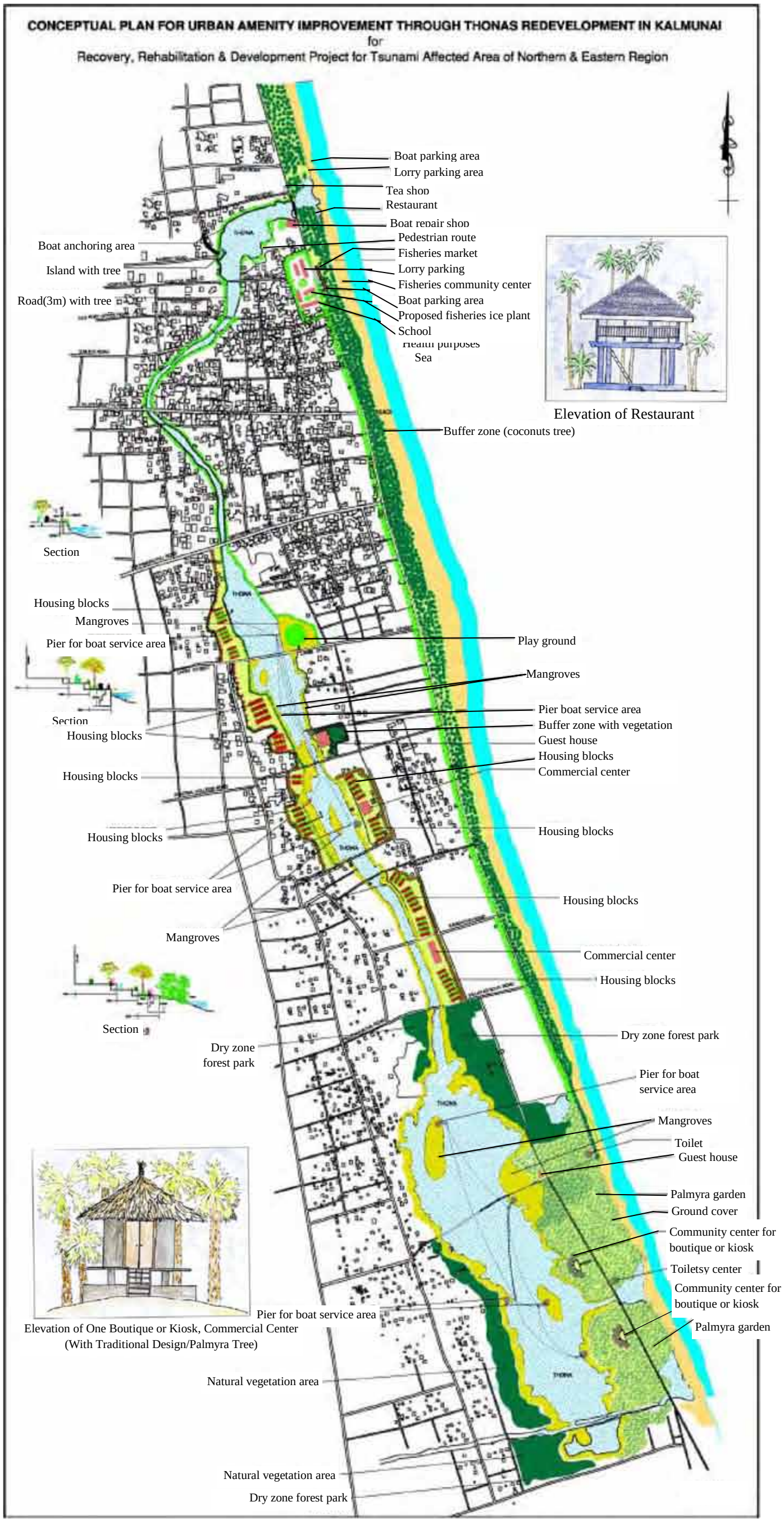


Figure 6.6.3 Thonas Redevelopment Plan

(2) Cost Estimate

The improvement of the Thonas is planned to be implemented for three years period.

The cost of Thonas improvement is estimated at approximately US$ 6.98 million. As shown below, principal cost will be bank protection of Thonas, which was seriously damaged by the tsunami and by illegal filling after the tsunami.

Table 6.6.8 Construction Cost of Thonas Improvement

(unit: US$ million)

Item	Cost
1 Dredging work	1.04
2 Construction of roads, bridges & culvert	1.21
3 Bank protection	3.90
4 Miscellenious work	0.83
Total	6.98

Note: This cost does not include private sector facilities such as restaurants and guest houses.
Source: JICA Project Team

6.6.5 Memorial Park Development

(1) Proposed Plan

It is planned that National Tsunami Memorial Park in Kalmunai will have the following facilities.

- Memorial features (old post office)
- Tsunami museum with sound and light shows
- Camping site
- Rest area
- Centre for sales outlets of seafood and local handicraft product
- Area of the park will be approximately 1.8 ha
- Development plan of the park are presented in Figure 6.6.4.

(2) Cost Estimate

Construction cost of the National Tsunami Memorial Park in Kalmunai is estimated approximately at USD 0.4 million as shown in Table 6.6.11.

Table 6.6.9 Construction Cost of the National Memorial Park

Item	Cost ($ 1,000)	Remarks
1 Land clearance/clearance of debris	1	
2 Preservation of damaged post office	5	
3 Tsunami museum/exhition hall	10	
4 Memorial arcade with Tsunami wave displa	30	
5 Sales outlet/toilet	50	
6 Infrastructure		
1) Road (30 feet width)	50	
2) Car parking	10	
3) Foot path (paved)	10	
4) Retaining wall	2	
5) Water supply/Electric wiring work	70	
6) Others	25	Fence, gate
7 Planting	25	
8 Memorial plaque name board	10	
9 Others	60	
Total	358	

Source: JICA Project Team

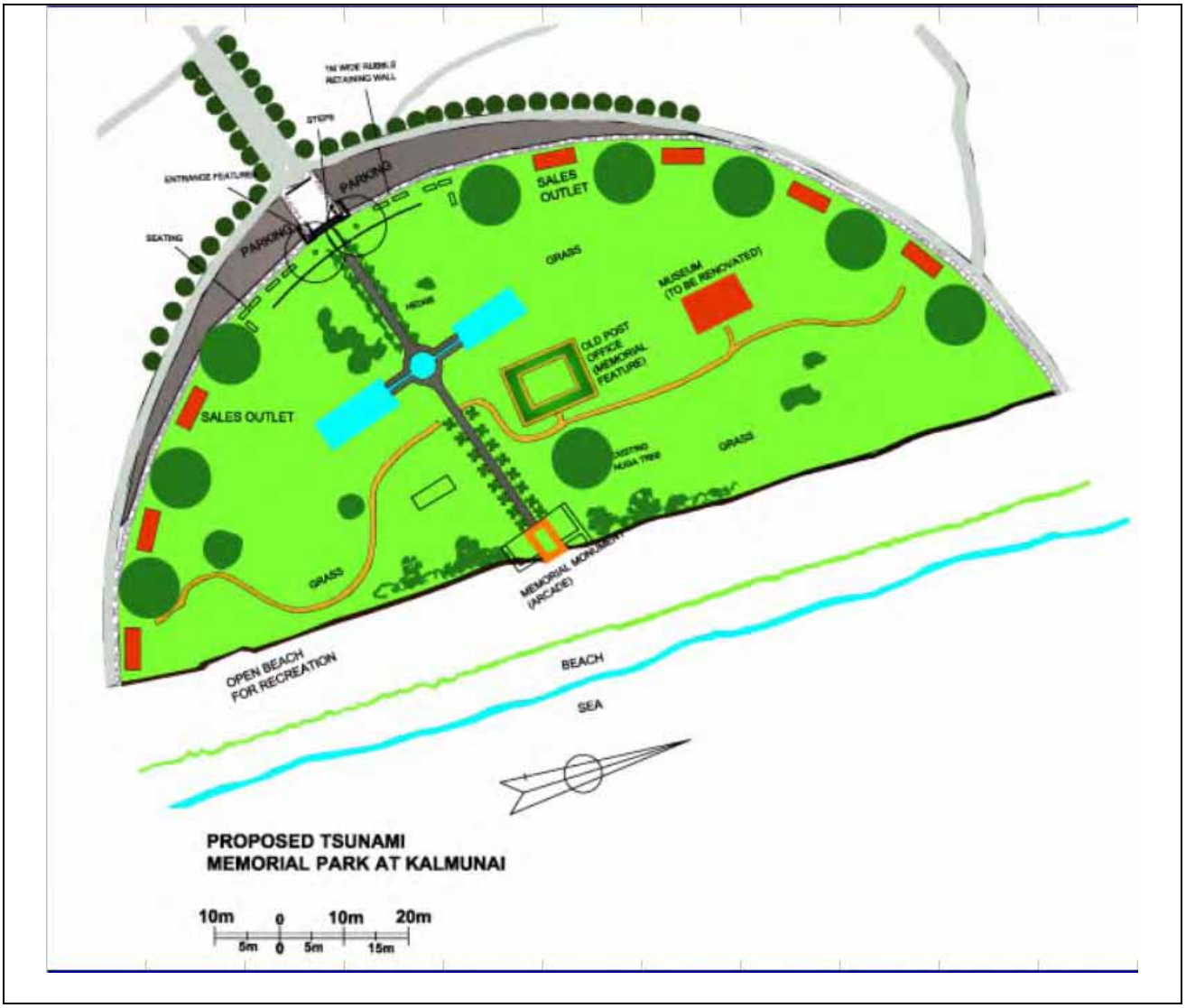


Figure 6.6.4 Plan of the National Tsunami Memorial Park in Kalmunai

6.6.6 Environmental Consideration

The priority projects comprises a wide range of projects including road improvements and upgradings, flood control, solid wastes management, urban amenity improvement and the development of emergency capacity. The implementation of these projects is anticipated to be before 2010. Since these projects will provide the basis for further development work scheduled until 2030. The expected environmental impacts have been reviewed and countermeasures for reducing these impacts or mitigating them have been suggested.

The projects and their associated impacts have been studied separately, while the cumulative impacts reviewed briefly.

(1) Present Environment in Kalmunai

Kalmunai is situated about 275 km east of Colombo on the eastern coast of Sri Lanka. The city has been established to a large part on a coastal dune network, bordered to the east by the Indian Ocean and to the west by lagoons and paddy fields. There is almost no relief, with a maximum altitude above sea level being about 4m+ abmsl. The city itself suffers from very high population density of approximately 4,500 persons per hectare. This has led to a wide range of environmental problems.

The land in this area is used for a wide range of different activities, including agriculture, homestead, paddy, playgrounds, as well as there being a number of large water bodies. One such water body is known as the Thonas and has been identified as suitable for development. In addition, the town supports a wide range of activities including health centres, schools, religious places, residential, scrubs, transport and other services.

As with many other parts of Sri Lanka the area currently suffers from significant environmental and social impacts as a result of unplanned and unsupervised development, building, sewage and wastes management, industry and other activities. Air quality is also poor due to traffic and poor exhaust technology and dusty roads. In addition, unplanned discharge of waste in public places and other sources lead to a number of difficulties associated with poor drainage. Livestock is free to roam throughout the area. Politically there are tensions between the different communities that live in this area. This tension is an extra complexity when considering environmental action.

Kalmunai was one of the worst affected regions in Sri Lanka by the tsunami of 2004. The tsunami brought massive damage, death and destruction to this township. Information relating to the environmental impact of the tsunami has been reviewed by the United Nations Initial Environmental Examination of Tsunami affected areas. The tsunami had significant impacts on the physical and social environment, both at the time of the disaster and in the following months. The Rapid Environmental Assessment undertaken by the United Nations Environment Programmeme makes reference to impacts on biodiversity, human settlements, waste and debris generation, soil and water quality, transport infrastructure, industrial sites in addition to the increase in poverty due to the destruction of livelihoods and psychological impacts.

(2) National Environmental Policies

Sri Lanka's domestic legislation as it relates to Environmental Impact Processes and

planning regulations are included in the National Environment Act No 47 of 1980 (NEA) and its various amendments. This is landmark legislation in relation to the protection and enhancement of the environment. It is widely acknowledged that there is still some way to go in reaching the goals that are stated within it; however it provides the legal framework on which to proceed. In addition there also exists the Coast Conservation Act 1981 (No 57 of 1981) and the Standard Environmental Impact Assessment (EIA) procedure which provides additional legislative structure.

The EIA process which is relevant to this study is based on the Gazette (Extra Ordinary) No: 772/22 which is dated June 23, 1993, No 859/14 dated February 23, 1995; No 1104/22 dated November 6, 1999; No 118/1 dated November 29, 1999 and No 1159/22 dated November 22, 2000 of the Democratic Socialist Republic of Sri Lanka.

The Central Environment Agency (CEA) is the authority for overseeing the EIA process, the process is then implemented by a number of statutory authorities, and these are designated as Project Approving Agencies (PAA). The NEA identifies two levels in the EIA process. The first level is the Initial Environmental Examination (IEE). The JPT has worked with the CEA to ensure that this document is integrated into this process and can be used as the relevant document for this purpose. The aim of the IEE is an assessment of the significance of expected impacts, the second level is the full Environmental Impact Assessment process (EIA) which is a comprehensive treatment of the project, where alternatives to the project and full mitigation measures are proposed.

The process is not intended to be strategic but rather is project based. Projects in the coastal area are also covered by the costal conservation act. This is specifically relevant to the area 300 meters from the mean high water line and two km seaward of the mean low water line. Some of the priority projects outlined in this report do cross this area and will therefore be regulated under this additional legislation.

The CCA however does not regulate what impacts are considered significant or not and therefore if a full EIA is required or not. However the regulatory body for the CCA, the Coast Conservation Department will make that judgement in the light of whether the IEE outlines impacts that they consider to be significant. There are additional regulations a project should propose for an “environmentally sensitive area” (ESA), projects proposed for these areas are subject to the National Environment Act No 56 of 1988.

The normal process is a preliminary scoping exercise to identify whether an IEE or an

EIA is appropriate. As outlined above it is anticipated that this document will fulfil that function. The IEE or EIA is then subject to a period of 30days for public comment. Any comments received are then provided to PAA. On submission of the revised document will approve or disapprove the project. If this decision is to be contested, an appeal can be made to the Secretary of the relevant Ministry.

The document is then subject to further technical appraisal and/or public consultation before a final, legally binding decision is made. Following approval an implementation committee is formed to oversee implementation. There are, however, a number of problems, specifically the technical nature of such documents and their inaccessibility to the general public due to their technical nature. It is important that in this case a summary document is produced to try and improve this issue. It may also be feasible or possible to compliment this with some basic public information seminars. National Environmental Policy is published in "Caring for the Environment 2003-2007" by the Ministry of Environment and Natural Resources.

For projects outside of the coastal zone as defined by this legislation, the NEA (1998) prescribes the list of 31 different types of project which are stipulated by an Order by the Ministry of Environment to require an IEE/EIA.

(3) Impact Assessment and Mitigation Proposed

Assessment of potential key impacts and mitigation measures are summarized hereafter.

Table 6.6.10 Potential Key Impacts and Mitigation Measures (Road Network Redevelopment)

Project Component	Environmental Impact	Mitigation
Improvement of National Road A4 11km of improved pavement and drainage	During construction may be temporary impact on vegetation, water resources and land use adjacent to route. Damage to local habitats Very slight impact on climate, due to release of some GHGs The work is designed to improve road and transport services; there may be improved safety to pedestrians. Access to this part of the Sri Lanka will be improved therefore it may have slight demographic results as some people may be attracted to settle adjacent to route Will improve access for emergency services and also for evacuation Dust and noise during construction phase Construction and operational phase will have environmental impact, increased air pollution and	Education of workforce Work only carried out in designated areas, areas that are damaged should be reinstated after construction phase. Only have engines running when required, ensure high maintenance of vehicles and choice of fuel to reduce emissions Positive Impact Positive Impact Clear work times, and use of fine water spray to reduce dust Traffic Management Plan, use of traffic

	decrease quality both during construction and afterwards, due to possible increase in traffic Water pollution may result from uncontrolled runoff, this is likely to be contaminated with hydrocarbons Wastes are likely to be produced during construction and subsequent maintenance Increased traffic congestion during construction period There are health and safety impacts for construction works.	lights or one way systems/diversions. Careful timing of work Filters used to catch hydrocarbon runoff Develop project wastes management plan (use in construction projects or reuse in same location) Health and safety instruction and equipment to be provided to all staff and contractors. Use of equipment to be mandatory.
Improvement of National Road A31 (raising road level and construction of new bridge)	Much of above, however in addition Possibility for land acquisition and resettlement exists as new bridge may entail access roads construction. An impact on freshwater systems over which it travels is probable, disruption of waters as new bridge is developed.	As above Appropriate Compensation Programme and Resettlement Action Plan (RAP) to be prepared through consultation with affected people and implemented Pre work sampling and sampling during work to ensure no undue pollution. Clear plan produced in case of significant pollution incident. Ensure any flow disruption does not cause additional impacts, erosion etc.
	This will allow a significant improvement to access into Kalmunai area and reduce polluting waters during the rainy season. It is likely to have a positive economic impact on the area, this will have other impacts. It will improve evacuation routes for the population of the coastal strip It is likely to have some detrimental environmental impacts during construction and operation such as air pollution from increased traffic Water Pollution may result from uncontrolled runoff, however reducing the amount of polluted water during rainy season is likely to be more significant. There may be an impact on irrigation scheme of paddy fields, increased polluted run off and construction disruption Construction and demolition waste is likely to be produced There will be increased noise, vibration and light, however this increase may not be significant to local population. Potentially will make road busier and therefore less safe for pedestrians and cyclists.	Positive Impact Positive Impact Positive Impact Traffic Management Plan produced and implemented Filters and sampling to be implemented Some sampling undertaken pre construction and after Part of project waste management plan, should aim to reuse or recycle waste Hours of work Provision made for pedestrians within final technical design.
Improvement of Internal Roads Pavements, drainage, expansion (12.2km)	As for above except for expansion component There may be removal of vegetation to the side of the road; this will increase the speed of water runoff. There may be pedestrian safety issues during construction	It will be important to carry out the work in a systematic and planned manner in consultation with the affected communities
	Temporary disruption of road network, during construction local congestion.	Traffic Management Plan implemented
Improvements of parts of coastal road (8.3Km)	As above	As above

Source: JICA Project Team

Table 6.6.11 Potential Key Impacts and Mitigation Measures (Solid Waste: Phase I 2006-2008/10)

Activity	Environmental Impact	Mitigation
Collection System	Slight climate impact as extra vehicle journeys made	Develop a logistics plan to ensure shortest route and also switching off of vehicles not in use. Good maintenance of fleet, environmentally sound choice of fuel and engines are also very important.
	Impact on residential areas during collection round, noise, odors	Agree time schedule with local community
	Possible health impacts from processes, possible public hazard	Public education and public health monitoring could be instituted
	Possible cultural sensitivities	Education and Engagement
	Impacts from vehicles maintenance and operation, wastes will be generated	Develop of maintenance schedule Develop of wastes plan for project
	Visual impact on locality during operation	Screening may be employed
	Opportunity of accidents and spills and subsequent public health risk	Emergency and Accident plan developed and practiced
	Health and Safety risk during operation of collection particularly to pedestrians and children	Education of public/workers and development of comprehensive health and safety protocol
	Generation of noise and dust	Monitoring, implementing action if exceed limits
	Encouraging presence of vermin (rats etc)	Good hygiene standards and possible anti vermin measures.
Depot (generic)	Normal construction issues (dust, noise etc)	As above
	Possible significant impacts during operation from vehicle movement and wastes generated	Waste Plan developed for site
	Also increase in traffic in local area and therefore pedestrian safety concerns	Improve traffic management system and have designated walk ways
	Site specific issues, once site is identified	Identify in future
Landfill Site	There are a number of potential impacts Possibility for land acquisition exists depending on the alternative sites to be selected.	Appropriate Compensation Programme for land acquisition to be prepared and implemented
	There is likely to be widespread disruption and destruction of local vegetation, animal habitats and ecological communities.	Minimise disturbance and reinstatement after process complete, improve bio diversity of alternative location as a park or nature garden to compensate.
	Climate impacting gases will be produced throughout life time of site operations	As above, development of gas collection and possible utilization programme
	It is likely to stigmatize the area that is finally decided upon	Development of surrounding area, perhaps into nature reserve
	May meet resistance from local population	Ensure local population is engaged from as early as possible. Involve local community in planning and construction of site and subsequent operation
	May present commercial and job opportunities	Positive Impact
	There is potential for local level health effects in case of poor operation standards	Monitoring and reporting programme for health of local community could be developed must develop baseline
	Impacts from supplying site with water and electricity	As for construction
	Emergencies are possible including explosion and fire risks	Emergency plan developed and Practiced
	Air pollution is possible	Monitoring and mitigate as required
	Water pollution is possible	Monitoring and mitigate as required
	Visual and local amenity disturbance is possible	Screening may be possible
	Number of risks particular to ground water supplies and any water abstractions within proximity Public hazard	Risk assessment should be commissioned to identify high risk water abstractions and other sensitive receptors, Monitoring programmes can then be implemented and remediation

	Risks and impacts also associated with bringing of construction materials to the site Impacts of wastes being bought to site Dropping of waste on access road and on highways Waste may be solid or liquid There is likely to be smells and odours Possible impact on proposed tsunami village Acceptance of hazardous wastes	implemented if required Public education Develop Health and Safety Plan H&S Plan Spill plan, also minimise by use of covering of loads Monitoring and perfuming may be possible Integrate with possible planning of tsunami village if at Oulvil May require EIA under Sri Lankan law, will need to be advised by CEA
Clinical Waste Burial (At Landfill)	Possible Health impacts	Take specialist advice and also plan as solely interim measure.
Leachate Treatment (At Landfill)	Disruption to local habitat, animals and vegetation Climate changing gases produced Leachate sludge produced (may be hazardous)	Reinstatement after construction Capture of gas produced and possible utilization Sludge disposal plan
Gas Collection and Use (At Landfill)	Possible odors and smells Explosive and fire risk Impacts on vegetation and dieback	Monitoring, planning of any development in surrounding area Emergency Plan Monitoring
Hazardous Waste Store and transfer out of area (At Landfill)	Many of the impacts and risks for landfill Impact from transfer of hazardous material Possible impacts from accident or emergency or spill on route Impacts from management of such wastes in other locations within Sri Lanka or overseas. Transport Impacts	Development of Emergency Plan Consultancy support required Emergency Plan Use of proximity principle (use closest possible appropriate location) Good engine and fuel choice, planning of transfers
Recycling and Reuse and waste minimization	Useful if products can be made or used Possible impacts from hazardous waste on public and individual health Transport impacts	Ensure local products need the waste Monitoring and education Transport Plan, including education concerning turning vehicles off not in use/engine use/fuels used etc
Transfer of Waste From Islamabath 	Many of the above impacts. Particular risk of significant river pollution incident if accident causes waste to go into river if transferred to Oulvil or into lagoon if other location	As above Clear spill response that has been independently agreed upon. Is likely to require EIA under Sri Lankan Law
Remediation of Islamabeth (option)	Use of heavy machinery Leaks of machine fluid Construction site nuisance, noise, dust Dealing with leachate at site	Good draining plan and spill response Transfer to new leachate treatment plant
Education and Engagement	Transport impacts	As above
Monitoring	Transport impacts	As above
Medical Waste Incinerators	Emissions (Dixons and Furans in particular) Clinical ash (Bottom and flyash) will be produced	Regular monitoring and development of externally agreed operations manual Develop protocols for transfer and burial of ash at new landfill facility. Dispersion modelling to ensure good siting of facilities Stringent operation and extensive training to operators Good regulation and inspection

Source: JICA Project Team

Table 6.6.12 Potential Key Impacts and Mitigation Measures (Solid Waste: Possible Phase II 2008-2010)

Activity	Environmental Impact	Mitigation
Transfer Station	Land acquisition will be required if selected location is not publicly owned land	Appropriate Compensation Programme for land acquisition to be prepared and implemented
	Construction impacts, local habitat, vegetation and animals are likely to be disturbed	Minimize disturbance and reinstate after project
	During operation disruption and impact of vehicles coming to and from site	Monitoring, use of fine water spray can reduce dust, providing water is of an adequate quality
	Dust, noise	
	Also smell impacts	
	Water runoff may be contaminated	Develop drainage plan for the site
	Difficult wastes to handle	Develop hazardous wastes plan
	Resistance from local community.	Involve local community in planning and construction of site and subsequent operation
Composting Facility	Land acquisition will be required if selected location is not publicly owned land	As in the case for Transfer Station
	Disruption of area during construction	Involve local community in planning and construction
	Smells	Maybe instigate some "compensation", such as local park or children's play area
	Leachate will be produced	Re-cycle leachate into compost, but monitor for toxic substances
From phase 1	As above	As above

Source: JICA Project Team

Table 6.6.13 Potential Key Impacts and Mitigation Measures (Debris Clearance)

Activity	Environmental Impact	Mitigation
Hazardous Waste Survey	Check for asbestos and other hazardous materials within debris and any remaining structures which need to be demolished.	Survey work Remove as found to appropriate standards
Demolition and Collection 	Slight climate impact as extra vehicle journeys made	Planning of journeys to ensure minimum number are made
	Demolition of structures (possible inclusion of dangerous and hazardous materials such as asbestos within debris)	Comprehensive pre demolition survey of hazardous materials and good disposal plan
	Impact on residential areas during collection round, noise, odors	Reduce amount of time required to do work, increase capacity
	Possible health impacts from processes, possible public hazard	Monitoring and public health campaign
	Possible cultural sensitivities	Ensure these are fully understood
	Impacts from vehicles maintenance and operation, wastes will be generated	
	Visual impact on locality during operation	Screening could be used if required
	Opportunity of accidents and subsequent public health risk	Develop Accident Plan
	Health and Safety risk during operation of collection particularly to pedestrians and children	Health and Safety plan and training Use of temporary signing and fencing
	Generation of noise and dust	Monitoring and develop hours of work
Cleaning and Sorting	Noise, dust of process, if water is used, water run off high in SS and may be contaminated with other materials	Develop collection protocol and project level wastes plan
	Sorting of toxic and hazardous materials from waste	Specialist advice will be required
	Normal impacts of using heavy machinery.	Minimize and reinstate
	Cutting machinery is available (noise and dust)	
Reuse	Sustainable approach to reuse this material, if not reused, then it can be crushed and used as soil conditioner or in construction works	As above
Disposal	As for landfill (however it is hoped that this will be minimum)	As above

Source: JICA Project Team

Table 6.6.14 Potential Key Impacts and Mitigation Measures (Urban Amenity Improvement of THONAS)

Activity	Environmental Impact	Mitigation
Fish Market (Collection facility, ice storage, packing)	Erosion and other land impacts during construction phase Disruption of local vegetation and habitat. Waste from the operation of this facility will include fish waste, damaged nets and other wastes associated with the fishing industry, including waste packaging	Minimize and reinstate as required Develop project level wastes management plan, look specifically for sustainable options for dealing with these wastes.
Fish Community Centre Workshop	Disturbance of vegetation and local habitat at construction site Opportunity provided for economic development and employment Impacts during construction (noise, vibration, dust) Risk to public during construction phase, use of lorries and construction equipment Generation of waste during construction and during operation	Minimize and reinstate/improve if possible Positive Impact Monitoring, screening and use of water sprays as well as hours of work, involve community As above
Restaurant/Shops Tourist destination 	Impacts during construction may include unregulated discharge into water, increased turbidity, chemical run off. Development of commercial, residential, industrial area. Improvement and enhancement of local environment Increased wastes produced. Increased opportunity for recreation activities and therefore litter risk. Disruption to local habitats as walkway is instituted	As above
Mooring Area (Improvement to fishing boat area)	During construction and operation may be impacts on water including increased water pollution (Bulge from any motor craft) paint and protection products from boats). Also increased turbity and reduction in water quality possible May be change in behavior of water flows and tidal changes. Increase opportunity for residential, urban and commercial use of land. This will again bring with it possible impacts, wastes, air, noise, visual and other amenity pollution. Improved sea access. Development of cultural area. Economic opportunities will be offered for local fisherman. Possible security concern access to public of special equipment and boats.	Monitoring of water for pollution, use of containment and treatment possible if significant contamination is identified Monitor and check Positive impact, but ensure that plans and infrastructure are in place Positive impact Positive impact Positive impact Fencing, lighting and signing
Improvement of damaged environment (Debris dredging and disposal) As above	Noise and vibration caused by dredging operation Reduction in water quality as containments may be released water It is likely that some of the dredging may be hazardous in nature	Minimize Monitoring and containment if required, however contextually likely to be limited significance Monitor, capture, treat or dispose if required It may be better to leave some of this material there to degrade slowly if dredging is going to release more contamination.
Urban amenity Construction (Walkway and park)	Vegetation and local habitat may be disturbed	Minimize and reinstate
Bank Protection	Impact from use of any machinery	Minimize and reinstate in case of

(repair work)	Change to flow patterns/ possible unexpected erosion issues	significant impact Monitor
Land Use control (Private development)	Local impact on vegetation, habitats Generation of waste and Noise, vibration during construction Dust generation Impacts of supplying infrastructure May change demographic and or cultural nature of locality Reduced access to local people if value of area increases significantly	Minimize and reinstate as required Development of project level wastes plan Screening, time schedules As above Mainly positive impact Control planning to ensure equitable access to area

Source: JICA Project Team

Table 6.6.15 Potential Key Impacts and Mitigation Measures (Memorial Park)

Activity	Environmental impact	Mitigation
Damaged House Preservation with Exhibition	It would not be expected that the construction of this facility would have any significant negative impact, there may be some construction noise and dust produced. Possible that if the area was to receive a lot of visitors during its operation then impacts such as erosion, litter etc may be experienced Beach may be accessed more at this point Possible opportunity for small beach bar to development economically, this may increase waste generation	The site could be screened during construction and work hours carefully regulated to ensure minimum inconvenience to local area. Local community in proximity to site should be engaged in design and build process. Good site plan should be developed to ensure that facility can cope with visitor numbers. Litter bins with regular collections, fencing, lighting, good security.
Commemoration Plaza with Plaque	Possible impact if wording is inappropriate	Ensure comprehensive community involvement and engagement
Infrastructure such as road water supply and electricity supply	May have impact in waste generation	As above (Project level wastes plan)

Source: JICA Project Team

Table 6.6.16 Potential Key Impacts and Mitigation Measures (Flood Control and Drainage Improvement)

Activity	Environmental Impact	Mitigation
Indian Ocean sub basin drainage	Damage to local vegetation and local habitat during construction, animals may be affected. Use of heavy machinery likely to lead to dust, noise and temporary reduction in local amenity Also possible leaks of hydraulic and motor fuels Change in water dynamics of area and subsequent effects on local ecological communities, vegetation and animals Emission of GHGs	Minimize and reinstate as required Screening Collection mechanisms implemented Survey undertaken may be commissioned Machines well maintained and good choice of fuel.
Lagoon sub basin drainage	As above	As above
Santhamaruthu sub basin drainage	As above	As above

Source: JICA Project Team

(4) Preparation of Institutional Requirements, Public Consultation and Information Disclosure

Institutional Requirements

Requirements for this work have been discussed with the Central Environmental Agency. The institutional requirements for each project are summarized and shown in Table 6.6.17.

In discussions with the CEA verbal assurance was received that there was unlikely to be any significant institutional barriers in terms of environment management for the implementation of this programme. However this will need to be confirmed in writing. There are some requirements for public disclosure of an IEE which have been outlined above. In addition, these projects may also need to be referred to the Coastal Administration Department to ensure that there are no requirements to be fulfilled.

Table 6.6.17 Anticipated Institutional Requirements

Project	Institutional Requirements
Road network redevelopment (Intra-city road (A31), Kalmunai internal	Environmental Clearance required from CEA/also refer to Coastal Authority
Solid Waste Debris Clearance	Clarification on need of full EIA for hazardous waste components from CEA/Possible refer to CA
Urban Amenity improvement of THONAS (lagoon)	Environmental Clearance required from CEA/refer to CA
Memorial Park	Environmental Clearance required from CEA/refer to CA
Flood control and drainage improvement	Environmental Clearance required from CEA/refer to CA

Source: JICA Project Team

There is however the need for clarification over the need for an EIA in terms of hazardous waste generated and disposed of under this programme. The law in Sri Lanka states that an EIA would be required if the project is;

“The construction of waste treatment plants treating toxic or hazardous waste”, the definition of hazardous waste is “toxic, corrosive, flammable, reactive, radioactive or infectious”

There is little doubt that the waste requiring movement from Islamabath would fall

within this definition and therefore it must be considered as a hazardous waste under Sri Lankan law. The key clarification required is whether landfill is considered a treatment plant or a disposal plant. This is a decision which needs to be made by the CEA on formal submission of a request for Environmental Clearance for the solid waste and debris component of these priority projects.

Public Consultation and Information Disclosure

The requirement under Sri Lankan law for public consultation and disclosure is relatively straightforward. In the case of an IEE, the report must be made public for 30 days, with opportunity to comment and ask for clarification. While not a requirement under law, it is recommended that a non-technical summary is made available so that the information can be accessed by the majority of society. There has been some criticism in the past that such reports are not accessible or sufficiently non-technical to allow the general public to access the information.

It is also recommended that all relevant information is to be disclosed to the relevant stakeholders including local and international non-governmental organizations, local and national government departments and any other interested party, to ensure that transparency is enhanced and facilitated. The IEE should also be translated in three (Tamil, Sinhalese and English).

6.6.7 Project Cost and Implementation

(1) Total Project Cost

Approximately US$ 34 million will be necessary for the implementation of the all projects of flood control and road improvement, debris clearance/solid waste management, Thonas restoration, and memorial park development as shown below.

Table 6.6.18 Cost of the Project

Item	Cost (US$ million)
1 Flood control and drainage improvement	
a Road network improvement of road network	3.4
b Development of inundation free measures	14.3
2 Debris clearance and solid waste management	1.8
3 Urban amenity improvement (Thonas restoration)	7.0
4 Construction of memorial park	0.4
5 Engineering service (15%)	4.0
6 Physical contingency (10%)	3.1
Total	34.0

Note: Compensation cost and price escalation are not included.

Source: JICA Project Team

(2) Organization for Implementation

For the implementation of the above project a Project Unit is proposed to be set up under the Ministry of Housing and Construction Industry as presented below.

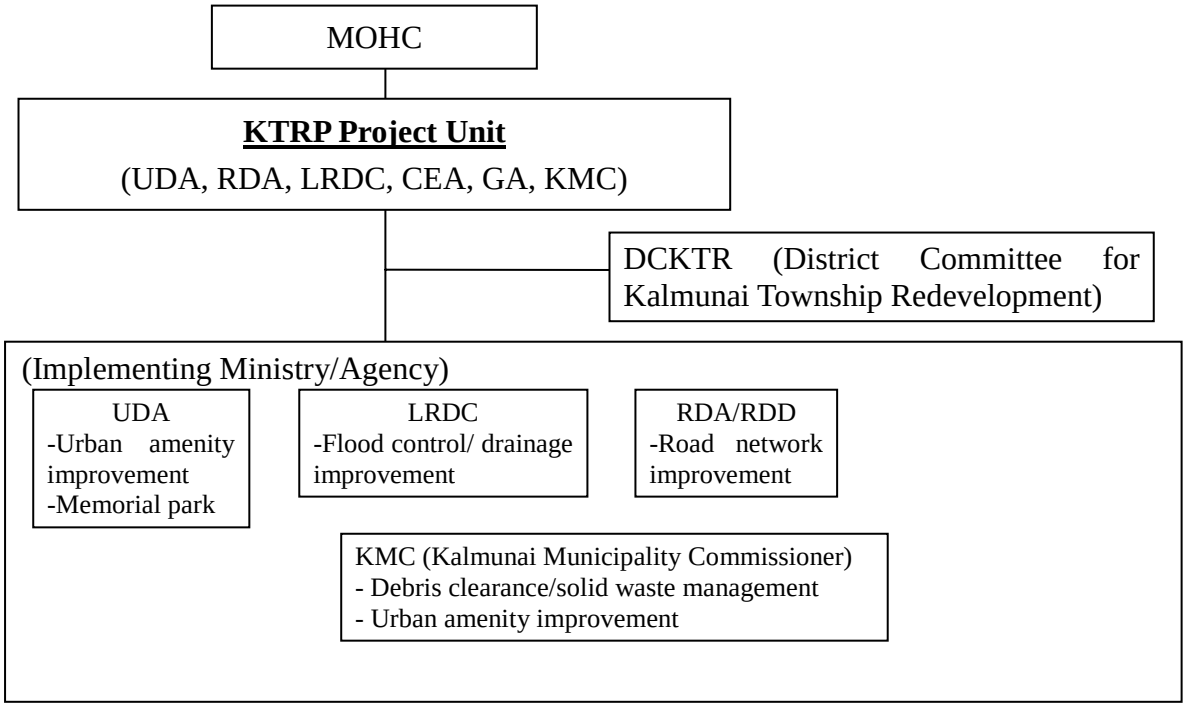


Figure 6.6.5 Implementing Organization Proposal for Kalmunai Township Redevelopment

During the operation and maintenance stage, Kalmunai Municipal commissioner under the province (GA) will be responsible for the developed infrastructure and facilities.

(3) Implementing Schedule

For the implementation of the project, five (5) years will be necessary as shown below in consideration of the engineering service period and contractor procurement time.

Table 6.6.19 Proposed Implementing Schedule of the Project

Year	2007	2008	2009	2010	2011	2012
Finance Arrangement						
Engineering survey/detailed design						
Tendering/Procurement of contractor						
Construction						
1 Flood control and drainage improvement						
a Road network improvement of road network						
b Development of inundation free measures						
2 Debris clearance and construction of landfill site						
3 Urban amenity improvement (Thonas restoration)						
4 Construction of memorial park						

CHAPTER 7 FISHERIES REDEVELOPMENT PLAN FOR NORTHERN AND EASTERN REGION

7.1 Rationale for Fisheries Redevelopment Plan

Necessity for preparation of the fisheries redevelopment plan for Northern and Eastern Region is well identified from the current situation of the sector as summarized below.

(1) The fisheries industry was the sector hardest hit by the tsunami, particularly in the Northern and Eastern Region. Approximately 75% of the fishing fleet (24,114 fleets) were damaged or destroyed by the tsunami, 70% of which were located in the Northern and Eastern Region. A total of 4,870 fishers died in a whole country, 75% of which are fishers in the Northern and Eastern Region.

(2) Income level of fishers engaged in coastal fisheries (using traditional canoe) is quite low. In addition, about 75,000 people out of 150,000 who lost their main source of income were in the fisheries sector. Redevelopment of fisheries is directly linked to the improvement of the livelihood in the whole country.

(3) About 60,000 mt of fish equivalent to about 25% of total fish production (253,190 mt) distributed to Colombo and other consuming areas from the Northern and Eastern Region in 2004. Recovery of fisheries sector in the Northern and Eastern Region is important for secure the food security in Sri Lanka.

In due consideration of the above situation, particularly, the serious damage to the fishery sector affected by the tsunami and the lower level of living standard, formulation of the long term plan for fisheries redevelopment is required in parallel to the execution of urgent rehabilitation works.

7.2 Policy Framework and Current Situation

7.2.1 Policy Framework

Preparation of the FRDP is to be guided by “National Fisheries Policy 2004 (Draft)” and “Strategy and Programme for Reconstruction and Development of the Marine Fisheries Sector (Nov. 2005)”.

In the National Fisheries Policy, rehabilitation of the Northern and Eastern Region is

expressed as one of the policy issues. It is recommended to undertake a comprehensive rehabilitation programme to bring fisheries activities, to rehabilitate damaged and destroyed fisheries-related structures, and making special efforts to invest in social-overhead capital in fishing communities and to settle displaced families. The Policy also mentioned instituting a mechanism guaranteeing fair distribution of help among the needy fishers and their families.

"Strategy and Programme for Reconstruction and Development of the Marine Fisheries Sector" focuses on reconstruction of Sri Lankan fisheries after the tsunami. The Strategy aims to improve the living standard of coastal communities in a sustained manner and helping to reduce help. Since the marine fisheries resources has already been highly exploited, the strategy pointed out that added wealth generation from the sector will depend on 1) resource management, 2) added value to the fish through product quality improvement, high level of processing and avoidance of post harvest loss, 3) expanding aquaculture.

7.2.2 Findings on Current Situation

(1) Outline of the Sector

1) General

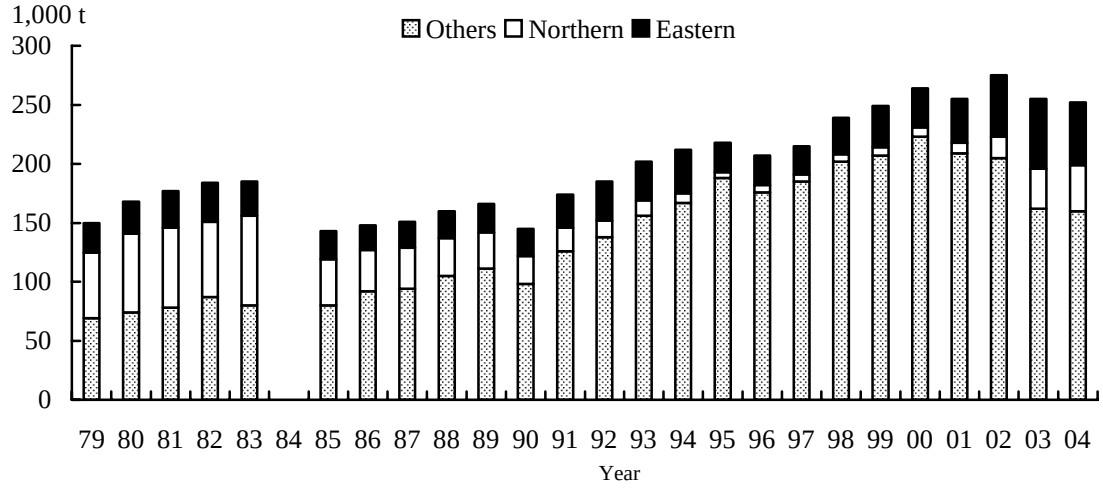
Fisheries sector is an important sector of the Sri Lankan economy as indicated below.

- Fisheries sector contributed 1.9% to GDP in 2004.
- Fish represents about 55 percent of the total animal protein supply (FAO. 2002).
- The sector provides the direct source of employment for 151,800 active fishers (2004) and for about 500,000 people in fish related businesses.

2) Resources and Production

The Northern and Eastern Region[1] produced 104,360 tons of marine fish in 1983, which corresponded to 57% of the national fish production. Although the production decreased to less than 20% of the national production from 1995 to 2000 due to the impact of the 20-year civil conflict, it has recovered since 2000, with peace accord in place and termination of the civil conflict. The Northern and Eastern Region produced 92,800 tons which corresponded to 36.7% of the national fish production in 2004 (see Fig 7.2.1).

[1] In this report, the NER includes six districts where have seriously damaged by Tsunami, namely Jaffna,



Note: Northern area includes Mannar District
Source: Fisheries Statistical Unit, MFAR

Figure 7.2.1 Trend of National Fish Production

FAO estimated[2] the annual fish potential of 87,000 tons (50,000 tons in North and 37,000 ton in East) in the Northern and Eastern Region. Since 39,310 tons and 53,490 tons of marine fish have been landed in the North and East respectively in 2004, the fisheries resource in the East seems to have been overexploited. In contrast, the Northern area still has ample room for exploitation, although the production volume has increased rapidly since 2002.

Regarding the deep sea fishing, Indian Ocean Tuna Committee (IOTC) reported[3] that the Maximum Sustainable Yield (MSY) of yellow-fin tuna in the Indian Ocean is approximately 300,000 - 350,000 tons, and total catches in 2003 (458,300 tons) and 2004 (495,100 tons) were substantially above MSY. Yellow-fin tuna is one of the main target species for off-shore and deep sea fishing in Sri Lanka, and landed 27,627 tons and 32,870 tons of yellow-fin in 2003 and in 2004 respectively. Since the resources of yellow-fin tuna in the Indian Ocean has already exploited above the MSY, it is difficult to expect the increasing of catch by the promotion of deep sea fishing in the Indian Ocean.

3) Fish Processing

Fish and fish-based processing and exporting industries or companies are mainly in Negombo and Chilwa in Western Region. There are no such facilities in the Northern

Kilinochchi, Mullaittivu, Trincomalee, Batticaloa and Ampara.

[2] FAO Fisheries Sector Study of the North-East Province, 13 August 2003

[3] Report of the Eighth Session of the Scientific Committee Victoria, Seychelles, 7-11 November 2005, IOTC

and Eastern Region, although the Northern and Eastern Region supplies the raw materials for fish processing, namely shrimps, cuttlefish, crabs, lobsters, and tunas.

In the absence of these facilities, the dry fish processing is predominant in the Northern and Eastern Region. About 70% of the dry fish processing is in the Northern and Eastern Region, and it helps to augment the family income of the large fisher population in the area.

4) Fish Marketing

The Northern and Eastern Region produced about 35% of total fish landings of the country in 2004 (see Table 8.1.1). The landings consisted of a relatively high proportion of exportable species such as tuna, shrimp, cuttlefish, etc.

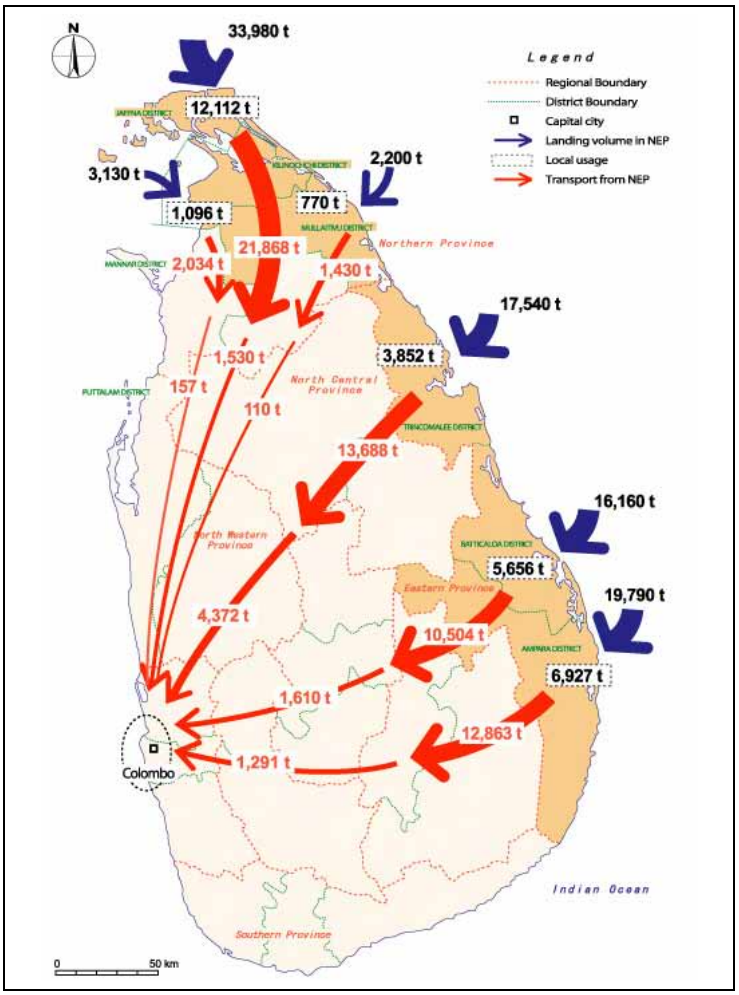
Table 7.2.1 Fish Production in Northern and Eastern Region in 2004 by Species by Districts

Unit : MT

Fish Composition	Jaffna	Killino-chchi	Mulliti-vu	Trinco-malee	Battica-loa	Ampara	Sub Total	SRI LANKA
Skipjack tuna	80	0	40	4,670	2,850	2,940	10,580	43,830
Yellow-fin tuna	130	0	0	2,640	1,690	1,670	6,130	32,870
Other Bloodfish	3,510	0	290	860	1,920	2,720	9,300	36,830
Shark/Skate	5,690	590	180	480	1,720	2,430	11,090	21,320
Spanish mackerel	1,090	90	110	340	280	1,420	3,330	5,260
Trevally	3,970	360	330	1,560	1,410	260	7,890	13,580
Rockfish	4,010	610	120	920	880	2,080	8,620	17,540
Shore seine varieties	6,920	510	330	5,190	3,490	2,860	19,300	53,410
Others	4,270	270	310	840	560	3,210	9,460	16,230
Prawn & Lobster	4,310	700	490	40	1,350	200	7,090	12,320
Total	33,980	3,130	2,200	17,505	16,150	19,790	92,755	253,190

Sources: Fisheries Statistics 2004, MFAR

Most of the fish landed is sold fresh (80%), while the rest is salt cured and dried (20%). Fish landed is transported to major urban centres such as Colombo, Kurunegala, Kandy, etc. or sold locally. Colombo has the main wholesale market namely St John's Market (SJM) and it is reported that SJM handles nearly 30% of the total fish landings of the island. The fish transported to the market from the north and eastern districts amounted to nearly 9,070 tons (1,797 tons from the north and 7,273 tons from the east). In addition, a considerable quantity of fish is transported to interior consumer areas, namely Kandy, Kurunegala, Ratnapura, Anuradhapura, and high land areas, etc. from the Northern and Eastern Region (see Figure. 7.2.2).



Source: JICA Project Team

Figure 7.2.2 Fish Distribution Volume from Northern and Eastern Region to Colombo

Almost 98 percent of marketed/distributed fish is handled by the private sector, while the share of the public sector (Ceylon Fisheries Corporation, CFC) is around one to two percent. CFC has only one purchase station in the study area that is in Trincomalee.

5) Fisheries Cooperative Society (FCS)

FCSs in Sri Lanka comprise a 3-tier structure, namely, primary or village-level societies, secondary unions and an apex federation. The overall objective of the societies is to jointly promote the improvement of the social, economic and cultural life of fishing communities. FCSs are supervised and administered by the Assistant Commissioner Cooperative Development (ACCD) in each district, and are supported technically by District Fishery Extension Office (DFEO). In the Northern and Eastern Region, 54,962 fishers out of 77,000 belonged to the 434 FCSs in 2004.

However, activities of the FCSs in the Northern and Eastern Region are limited due to insufficient seed capital and low capacity in FCS management. Federations and Unions which support FCSs are not fully operational in the Northern and Eastern Region except in Jaffna.

6) Institutions and Services

The Department of Fisheries and Aquatic Resources (DFAR) is the main implementing agency for the administration and development of all districts in the country. DFEO are DFAR field offices led by Assistant Directors of Fisheries and Fisheries Inspectors (FIs).

GOSL provides the following services to develop the fisheries sector (see Table 7.2.2).

Table 7.2.2 Summary of Government Services

Target	Service	Service Providers
Fishing boat & fishing gears	Subsidy available to introduce multi-day and day boat (50%); non-mechanized crafts (50 – 90%). Subsidy increased to Rs 2.5 million for replacement of multi-day boats after tsunami.	MFAR
Trade	Tax exemptions for import & export of fish products	Internal Revenue
Marketing	Stabilize fish prices; supply ice; provide fishing port & anchorage facilities; fish quality assurance	CFHC, CFC, Fish quality dept. (MFAR);
Private sector	Investment in excess of $5 million (including fisheries) with 3-year tax holiday; concession rate of 10% of tax for the next 2 years; import duty exemption for capital goods	Internal Revenue, Board of Investment
Fisheries credit	Credit scheme (at 4-6% interest) is available.	MFAR, Commercial banks (16% interest)
Training	Training of fishers and youth aspiring to employment in fisheries sector is provided by NIFNE.	NIFNE

Source: JICA Project Team

However, DFAR have deficiencies due to structural weakness, organizational problems and limitations, and these are seriously affecting their performance.

The field offices have been damaged by the tsunami including office buildings of Assistant Directors, branch offices of FIs, MCS units along with equipment, documents and records. However, as emergency measures some structures have been rehabilitated and have been provided with some administrative equipment and mobility facilities. All field offices in the Northern and Eastern Region have insufficient number of FIs in comparison to the number of FI divisions in each district (see Table 7.2.3).

Table 7.2.3 Current Status of DFEOs

	FIs		ME	FRMA	Vehicle	Motor-cycle	Computer	Others
	Existing	Required						
Jaffna	9	14	1	1	1 (NR)	6 (new)	3	1 copy machine
Mullaittivu	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Kilinochchi	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Trincomalee	2	11	1	4	1 (old)	4 (old)	2 (1 new)	1 copy machine
Batticaloa	6	12	1		1			
Kalmunai	11	11	0	6	1	11	4 (new)	1 copy machine (new)

Remarks: 1) FI (Fisheries Inspectors); ME (Marine Engineer); FRMA (Fisheries Resources Management Assistant); NR (old and not in running condition)
2) Jaffna DFEO is a rented building.
3) New indicates provided by donors and NGOs after tsunami.

Source: JICA Project Team

In addition to the shortages, FIs in the Northern and Eastern Region had very limited opportunities for training during the long period of civil conflict. Hence, the knowledge and technical know-how of these officers may be deficient to the current needs.

Department of Cooperative Development

The Department of Cooperative Development, under the Ministry of Agricultural Marketing Development, Cooperative Development, Hindu Affairs and Assisting Education and Vocational Training, engages in providing assistance to expose general public with cooperative concept; establish cooperatives through registration; set up administrative mechanisms for guiding and supervising these cooperatives; intervene in deciding on arbitrations; amalgamate and divide cooperatives when necessary; undertake the audit, investigations, inquiries; provide opportunities for funds; and liquidate cooperative when necessary. Beside various cooperatives, the above described FCSs are also one of their target cooperatives.

The above assistances are currently much decentralized to provincial governments and ACCDs and the Department focuses on overall statutory and supervisory functions.

Other institutions (Parastatal Organizations)

There are fisheries related institutions (parastatal organizations) under MFAR. Their main roles and functions are as follows:

- National Aquatic Resources Research and Development Agency (NARA)
  Develop/manage the aquatic resources and provide scientific, technical and

technological advice to relevant agencies

- National Aquaculture Development Authority (NAQDA)
  Develop/manage the inland fisheries and aquaculture
- Ceylon Fisheries Harbor Corporation (CFHC)
  Construct, operate and manage all fishery harbors and related facilities.
- Ceylon Fisheries Corporation (CFC)
  Fishing operations, operation of ice plants and marketing of fish products.
- National Institute of Fisheries and Nautical Engineering (NIFNE) :
  Conduct higher educational programme related to fisheries & streamline to academic, professional education and training activities
- Cey-Nor Foundation LTD (Cey-Nor)
  Production and sales of FRP fishing boats, netting and ice.

(2) Characteristics of the Fisheries in the Northern and Eastern Region

Characteristics of the fishery in the Northern and Eastern Region are summarized on Table 7.2.4.

Table7.2.4 Summary of Characteristics of Fisheries in the Northern and Eastern Region

Indicators	National	Northern and Eastern Region
1. Fisheries GDP	Rs 36,700 million (2004)	Rs 12,627 million (2004)
2. Share of fisheries GDP	1.9% (2004)	0.65% (2004)
3. Number of fishers (marine)	151,800 (2004)	77,000 (2004)
4. Marin Fish Production	253,190 mt (2004)	92,800 mt (2004)
5. Operating fishing boats	MDB (IBE) = 1,581 DB (IBE) = 1,493 FRP (OBE) = 11,559 Traditional (OBE) = 674 NMT = 15,260 Beach seine = 1,052 **Total = 30,567**	MDB (IBE) = 52 (3.3%) DB (IBE) = 827 (55%) FRP (OBE) = 3,906 (34%) Traditional (OBE) = 369 (55%) NMT = 7,730 (51%) Beach seine = 480 (46%) **Total = 12,884 (42%)**
6. Productivity (ton/fisher/year)	1.67 mt / fisher	1.21 mt / fisher
7. Services (fishers/DF staffs)	150 FIs (1,012 fishers/FI)	28 FIs (2,750 fishers/FI)
9. Average Income of fishers (coastal)	Non-motorized canoe : Rs 2,348/month Motorized canoe : Rs 5,231/month	
10. Paddy (ploughing)	SLR 5,280/month	
11. Tea (planting)	SLR 4,620	

Remarks: MDB (multiday boats); DB (day boats); FRP (fiber reinforced plastics); IBE (inboard engine); OBE (outboard engine); NMT (non-motorized traditional); BS beach seine.
Source: JICA Project Team

(3) Outline of the Fisheries Sector in Each District

Outline of the fisheries sector in each district is summarized on Table 7.2.5.

Table 7.2.5 An Outline of Fisheries Sector in Each District

	Production volume/Main species	Fishing ports	No. of operating boats in 2004	No. of fishers and Productivity/fisher	FCSs	Ice demand / supply	Development potential	Developing constraints
Jaffna	Production in 2004 33,980 t Main landing species Shark/skate 5,690 t (17%) Prawn 4,150 t (12%) Rock fish 4,010 t (12%)	Myliddy fishing port, Karainagar fishing port Both ports are not operational due to security reason.	Multi-day Day boat 163 FRP 1,124 Motorized canoe 68 Non-motorized canoe 2,560 Total 3,915	17,060 fishers Productivity : 1.99 tons/fisher	117 FCSs belong to 11 unions. 3 unions out of 11 conduct fish marketing, and most of unions sale fishing gears. 6 Idiwara banks are operated.	Estimated demand of ice is 22,000 tons/year, but no ice plant in the district. Ice is supplied from outside of the district.	• High catch of exportable species (prawn).	• Landing hour is restricted to 06:00 to 18:00. • Highly security areas scattered along the coast hinders fisheries development.
Killinochchi	Production in 2004 3,130 t Main landing species Prawn 700 t (22%) Rock fish 610 t (19%) Shark/skate 590 t (19%)	No fishing port in the district	Multi-day Day boat 12 FRP 246 Motorized canoe 149 Non-motorized canoe 330 Total 737	3,660 fishers Productivity : 0.86 tons/fisher	20 FCSs existed (August 2004.)	Estimated demand of ice is 4,000 tons/year, but no ice plant in the district. Ice is supplied from outside of the district.	• High catch of exportable species (prawn).	• Levies on fish products by LTTE. • Prawns solely handled / marketed by LTTE. • Unloading & loading at security check points lowers quality & increases marketing cost.
Mullative	Production in 2004 2,200 t Main landing species Prawn 490 t (22%) Trevally 330 t (15%) Other Blood fish 290 t (13%)	No fishing port in the district	Multi-day Day boat FRP 562 Motorized canoe 48 Non-motorized canoe 220 Total 830	3,250 fishers Productivity : 0.68 tons/fisher	21 FCSs belong to a union. The union collects and sale catch of the FCSs. All facilities are destroyed by tsunami.	Estimated demand of ice is 2,500 tons/year, but no ice plant in the district. Ice is supplied from outsides of the district.	• High catch of exportable species (prawn). • Near to tuna fishing ground.	
Trincomalee	Production in 2004 17,540 t Main landing species Skipjack 4,670 t (27%) Yellow-fin 2,640 t (15%) Trevally 1,560 t (9%)	Cod-bay fishing port Used by day boats and multi-day boats including multi-day boats from outside of the district) No significant damage by tsunami. ADB plans rehabilitation.	Multi-day 46 Day boat 218 FRP 1,316 Motorized canoe 12 Non-motorized canoe 1,190 Total 2,782	20,250 fishers Productivity : 0.87 tons/fisher	About 40 FCSs out of 80 are active, and 20 are relatively active. The rests are not active. 7 FCSs in Muthur carry out micro finance and sales of catch and fishing gears.	Estimated demand of ice is 23,000 tons/year while capacity of ice plant in the district is 45,000 tons/year. Two 10 tons plants will be installed by Japanese Non-project GA.	• Accessible to tuna fishing ground in front of Mullative. • Developed market channel to Colombo. • Lagoon in northern area.	• Landing hour is restricted to 06:00 to 18:00 in the Northern part of Trincomalee.. • Need navy's permission for the fishing operation in the Northern part of Trincomalee..
Batticaloa	Production in 2004 16,160 t Main landing species Skipjack 2,850 t (18%) Other Blood fish 1,920 t (12%) Shark/skate 1,720 t (11%)	Valachchenai fishing port. Not operational due to security reason. ADB plans rehabilitation in 2006.	Multi-day Day boat 186 FRP 318 Motorized canoe 8 Non-motorized canoe 2,510 Total 3,022	23,690 fishers Productivity : 0.68 tons/fisher	About 50 FCSs out of 120 were active, and 14 of them have the Idiwara Fisheries Bank.	Estimated demand of ice is 12,000 tons/year while a ice plant operated by CFC has capacity of 5 tons/day. A 10 tons plant will be installed by Japanese Non-project GA. Ice is supplied from outsides of the district.	• Batticaloa has the second largest lagoon in the country. • Tunas migrates off shore areas from Ampara to Mullative.	• Many unclear areas along the Lagoon areas. • Development of new prawn farming in Batticaloa Lagoon is restrained by District Environmental Enforcement Committee.
Ampara	Production in 2004 19,790 t Main landing species Skipjack 2,940 t (15%) Other Blood fish 2,720 t (14%) Shark/skate 2,430 t (12%)	No fishing port in the district	Multi-day 6 Day boat 248 FRP 340 Motorized canoe 84 Non-motorized canoe 920 Total 1,598	17,300 fishers Productivity : 1.14 tons/fisher	16 FCSs out of 69 which are in marine sector have Idiwara Fisheries Bank.	Estimated demand of ice is 14,000 tons/year. Two 10-tons plants by Non-project GA by Japan, and a 5tons plants by NGO is pledged. Ice is supplied from outside of the district.	• Tunas migrates off shore areas from Ampara to Mullative.. • Lagoon in southern area.	• No appropriate site for fishing port.

Source: JICA Project Team

(4) Issues to be Tackled

1) Constraints and Potential of Sector Growth

Limited fisheries resources

Since the limitation of coastal fisheries resource and yellow-fin tuna in the Indian Ocean, it is difficult to expect the increase of fish production. As mentioned in the "Strategy and Programme for Reconstruction and Development of the Marine Fisheries Sector"[4], resource management and added value to the fish are keys for redeveloping the fisheries sector.

Increase of Added-value and Reduce of Post-Harvest Losses

Fish and fish products trade of Sri Lanka has been growing steadily. Sri Lanka exports high market value fish products (e.g. tunas and shrimps) and imports low market value products. Sri Lanka imported fish and fishery products about 5 times of exports in quantity in the past 5 years (2000 - 2004) although the import value was equivalent to about 60% of the export value. In 2004, Sri Lanka imported 67,284 tons of fishery products which was equivalent to 24 % of total fish production (286,370 tons) in 2004.

However, CFC reported[5] that fish waste is high especially in catches of multi-day boats targeting tunas. Around 30 –40 percent of the catch landed by these boats are of poor quality due to poor handling practices and preservation methods. Reducing the post harvest loss is one of the important issues to secure food security of Sri Lanka and to improve the income level of fishers.

On the other hand, the economic growth in Sri Lanka brings a shift in consumer demands towards high value food products. Per capita consumption volume of prawn and crab has increased to more than 4 times from 1995/6 to 2002/03. It is considered that there is some potential to increase the demand of the high marketable value fish products in the domestic market.

High investment cost

Off-shore and deep sea fishing require high investment. A multi-day boat costs Rs. 3.9 million (include engine), and a day boat costs Rs. 1.8 million. Although MFAR

[4] Strategy and Programme for Reconstruction and Development of the Marine Fisheries Sector, MFAR, November 2005.

[5] Trash fish production & national fish feed requirements in Sri Lanka, Paper presented by N. B. Nevil1 at the "REGIONAL WORKSHOP ON LOW VALUE AND "TRASH FISH" IN THE ASIA - PACIFIC REGION" Hanoi, Viet Nam, 7-9 June 2005

subsidies 50% of the boat cost, most of the coastal fishers cannot afford to pay the remaining 50%, and thus, it is hard for coastal fishers to transfer from coastal fishing to off-shore and/or deep sea fishing.

On the contrary, a FRP boat with an outboard motor (OBM) costs only Rs. 260,000, but it can only be used for coastal fishing. However, a private fish processing company has a plan to introduce a larger size FRP boat (7.6 m). Though it cost about Rs. 350,000 (without OBM), this FRP boat is designed for tuna long line, and has space for an ice box, and gutting on the boat.

2) Inequity and Problems caused by Reconstruction of the Sector

It is reported that some assistance of donors / NGOs make negative impacts in the fishery sector. A large number of fishing boats, engines and equipment have been provided for replacement of damaged equipments. These assistances often pay less attention to resource utilization, needs of fishers and communities, optimal method to provide services, etc. On the other hand, in the Northern and Eastern Region, especially in Jaffna, many fishers who have lost boats and gears are not eligible for assistance due to their incomplete registration during the conflict. As a result, the following problems are raised in the sector after tsunami.

- Assistance provided does not always meet the fisher's needs
- Dependency created through provision of un-coordinated aid
- Weakening community, society and ethnic relationships
- Inequity among fishers, between fishers and traders

Influx of fishing boat and equipment and technical issues

Donors/NGOs provided FRP boats and traditional canoes. Number of FRP boats provided has already exceeded to the destroyed number of FRP boats in the Northern and Eastern Region (see Table 7.2.6).

Table 7.2.6 Number of Fishing Boats in Northern and Eastern Region Before and After Tsunami

	No. of Boats				
	in 2004	destroyed by tsunami	replaced / pledge to replaced	in 2005 (estimation)	Balance
Multi-day Boats	52	3	0	49	3
3 1/2 t day boats	827	90	2	739	88
FRP boats	3906	3,684	3,191	3,413	493
Traditional canoe (Motorized & Non-Motorized)	8099	9,042	6,092	5,149	2,950

Source : Reconstruction & Development of Fisheries Sector Affected by Tsunami, 31.12.2005, MFAR

Since coastal resources are overexploited, and oversupply of FRP boats will cause resource problem in the future.

The number of fishing boats provided is not in proportion to the number of destroyed boat. According to the "Reconstruction & Development of Fisheries Sector Affected by Tsunami", an oversupply of FRP boats is seen in Jaffna, Kilinochchi and Ampara. However, these data compiled only the number of boats that Donors / NGOs reported to MFAR. There is a number of unreported boats provided by NGOs. Recent data of operation boats that the JICA Project Team collected from DFEO is summarized in Table 7.2.7. This data shows that the original number of boats was almost regained in these 3 districts.

Table 7.2.7 Comparison of Boat Number Before/After Tsunami in Some Districts

	Jaffna		Batticaloa		Ampara	
	2004	Oct.2005	2004	Jan.2006	2004	Jan.2006
Multi-day Boats						5
3 1/2 t day boats	163	115	186	218	248	151
FRP boats	1,124	2,151	318	382	340	534
Canues (motorized /non motorized)	2,560	2,573	2,510	2,186	920	924
Total	3,847	4,839	3,014	2,786	1,508	1,614

Source : Data in 2004 ; Fisheries Statistics in 2004, other data is from DFEO in each district

It is reported that many fishers who did not have a boat received a boat from donor agencies and NGOs. Some of these beneficiates do not enough experience and skills to utilize these boats and equipment provided. For instance, fishers who are member of Veloor FCS in Trincomalee received 6 FRP boats from a NGO did not mount fishing nets for more than one month although they received materials for fishing net with boats and engines; the reason was they did not know how to mount fishing nets. The NGO plans to hold training for mounting fishing net for these beneficiaries.

In addition, assistant directors in the Northern and Eastern Region pointed out that some NGOs provided inappropriate specification of boats to tsunami-affected fishers e.g. provision of a bigger canoe for lagoon fisheries or FRP boats which do not have enough strength.

Weakening society relationship and other social issues

Since donors/NGOs provide boats and equipment through the FCSs, many fishers have become members of FCS after the tsunami. In addition, there are cases in which some members plan to withdraw from the society and to establish a new society for getting more assistance such as boats and equipment. According to ACCD

Trincomalee, 35 new FCSs have been registered in Trincomalee District after Tsunami.

The Veloor FCS, a target group of the fisheries pilot project in Trincomalee also faced similar problems. Some of the society members insisted on establishing a new society in order to get more assistance from NGOs

3) Poverty Problems in the Sector

Poverty in fisheries sector

According to the Department of Census and Statistics, the poverty line of Sri Lanka in 2002 was Rs. 1,423 per person per month. Since the average size of a fisher's household in 2004 was 4.67 persons, the minimum income level required was estimated to about Rs. 6,500 per household when poverty line in 2002 was adopted.

MFAR reported that average monthly incomes of fishers using mechanized / non-mechanized canoes were Rs. 2,348 and Rs. 5,231, respectively. Average income of lagoon fishers target shrimps was Rs. 6,500 on the borderline of poverty line.

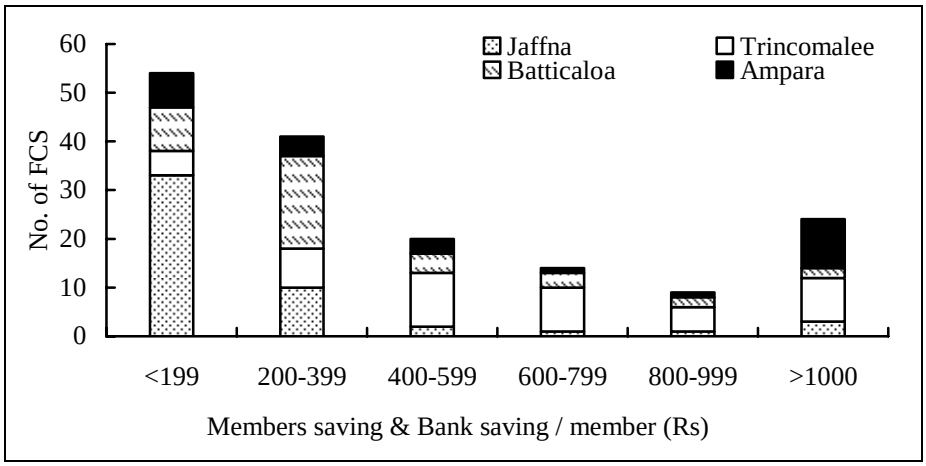
"Households Profile Survey" by the JICA Project Team shows lower income levels in fishers household. 137 household out of 391 which are planned to move to Japan Sri Lanka Friendship Village are engaged in fisheries sector, and 114 fishers households (80%) earned less than Rs. 5,000 per month before the tsunami.

In 2004, there were 674 mechanized canoes and 15,260 non-mechanized canoes in Sri Lanka, and 445 mechanized canoes and 8,300 non-mechanized canoes were in the Northern and Eastern Region. Fishers who engaged in canoe fishing are categorized as poor households based on the official poverty line in 2002.

In this report, these fishers categorized in the poverty group are referred as "small scale fishers".

Limitation of access to funding sources

Small scale fishers have only limited access to funding sources. The loan scheme of FCSs is one of the popular funding sources the members can access easily. However, the seed capitals for loan service of the FCSs are very small. As shown in Fig. 7.1.3, about 60% of FCSs in the Northern and Eastern Region have savings of less than Rs. 400 per member for the seed capital. As a result of this small financial capacity of the FCSs, most of the FCSs have a maximum credit amount of Rs. 10,000.



Source: Plotted by the JICA Project Team based on the data provided by MFAR

Figure 7.2.3 Member's Saving & Bank Saving/Member of FCSs in Northern and Eastern Region

It is indispensable to strengthen the financial capacity of FCS for promoting additional income generating activities such as backyard culture, fish processing and non fisheries related small scale businesses.

4) Poor Institutional Capacity

Weak capacity of government officer

According to DFAR, DFEOs in charge of fisheries administration and development in each district have not functioned well due to the issues mentioned in Table 7.2.8.

Table7.2.8 Required Duties for Government Staff and their Issues

Staffs	Required duties/activities	Issues
Assistant Directors (DFEO)	Administer & carry out duties on behalf of DG to register, license boats & gears; propose management plan; legal power to arrest; supervise FIs activities, etc.	Lack logistics, mobility and communication facilities; inadequate in appropriate knowledge and skill to transfer to stakeholders.
Fisheries inspectors (FIs)	Administer allocated FI division; prepare & implement monthly programmes after approval by ADs & DG; keep diary of activities	Lack of qualification and have no appropriate skills and knowledge on fisheries; limited or no training provided
Fisheries Resource Management Assistant (FRMA)	Recently recruited to complement ongoing tasks of FIs; to focus on resource status & fishing pressure thru frequent visits to landing sites; propose on changes in boats & gears; information on fish demand, sales & prices to fishers.	Recruits have qualification on paper (degree) but need training on fisheries activities and resource management aspects
Marine Engineer	Supervise boat yards, check boat designs, service fishers needs on engine repair	Lack logistics and transport facilities
Cooperative inspector	Organize fishers and register fisheries cooperatives societies; supervise activities; audit accounts	Inspectors are not under the DFAR supervision; has no technical know-how; do not foster or instill development attitude or cooperative spirit of societies.

Source: JICA Project Team

Although the DFAR plans to improve human resources through the allocation of 38 FIs in the Northern and Eastern Region and FRMA (one person per FI division), DFAR does not have any training programme for these FIs and FRMA due to limitation of the budget; thus these new employees will be trained on the OJT basis.

Weak capacity of NGO/FCS

NGOs working in fisheries sector also do not have appropriate capacities of organizational coordination. Most of the NGOs work individually, and have less information exchanges among the NGOs although FAO holds regular coordination meetings. Most of the FCSs also do not satisfy their required duties stipulated in Cooperative Societies Act, N. 11 of 1972, and Cooperative Societies (Amendment) Act, No. 11 of 1992 due to insufficiency of technical and financial capacities (see Table 7.2.9).

Table 7.2.9 Required duties and issues of NGO/FCS

	Required duties/activities	Issues
NGOs	Support people facing problems at grass-root levels	• Lack of coordination among the NGOs/ organizations cause unnecessary duplications of activities • The gap between staff at managerial level and field level
FCSs	Enhance livelihood of its members and fishing communities through: • Providing saving and credit service/ pension scheme • Promote collective procurement and sales of fisheries inputs • Facilitating marketing of fish • Providing welfare services to FCSs as well as to community members • Conducting training programmes • Acting as a recipient for assistances from the government and other organizations	• Lack of capital • Poor FCS management • Lack of unification among members • Lack of support from the government

Source: JICA Project Team

Unstable environments

There are still some restrictions which hinder fisheries development particularly in the Northern and Eastern Region (see Table 7.2.10). These restrictions are understood by the both government side and LTTE side.

Particularly, Jaffna has many constraints in comparison with other districts due to restrictions such as passing check and levy of LTTE, etc.

Since these restrictions are political issues, their removal or easing is difficult unless

the political situation in the Northern and Eastern Region improves. However, there is a case of a FCS Union in Jaffna that removed the restriction on shrimp marketing (sole activity of LTTE) through the negotiation with LTTE. Therefore, it is possible that the capacity building of FCS will lead to removal or easing of restrictions and improving development condition in the fisheries sector.

Table 7.2.10 Restrictions on Fisheries Sector

Activities	Constraints by conflict	Area
Fishing	• Out-board engine: less than 15HP hinders off-shore fishing.	North - East
	• Landing hour: restrict to 06:00 to 18:00.	Jaffna North of Trincomalee (Since Jan 2006)
	• Needs permission for fishing operation from Navy.	North of Trincomalee (Since Jan 2006)
Landing site	• Fishing ports in high security zone are occupied by army.	Jaffna
	• Highly security areas scattered along the coast hinders fisheries development.	Jaffna
Marketing & Distribution	• Levies on fish products by LTTE. • Prawns solely handled / marketed by LTTE. • Unloading & loading at security check points lowers quality & increases marketing cost.	Jaffna, Killinochchi, and Mullative

Source: JICA Project Team

Poor information

Because of the civil conflict in the past two decades, only limited information is available in the Northern and Eastern Region. “Household Income and Expenditure Survey” conducted by the Department of Census and Statistics in 2002 did not cover the districts in the Northern and Eastern Region. “Marine Fisheries Survey” conducted as a part of “Marine Resource Management Plan” in 1980’s also did not cover unclear areas including the Northern and Eastern Region. According to DFAR, it is estimated that only 60% of boats were registered before the tsunami although fishers are mandated to register fishing boats.

The number and allocation of fishing boats in the Northern and Eastern Region changed due to impact of the tsunami and the influx of large amounts of fishing boats by donor agencies / NGOs. However, most of these boats have not been registered. Since the number of existing boats is essential information for resource management, implementation of a fisheries census is required urgently.

7.3 Planning Objectives and Development Strategies

7.3.1 Objectives

The Fisheries Re-development Plan (FRDP) aims to restore the fisheries from damages of the tsunami, and to offer necessary and urgent improvements to create conditions for sustainable development of fisheries sectors and to uplift the livelihood of fishers in the Northern and Eastern Region.

7.3.2 Development Concept

Under the framework of limited fisheries resource, the FRDP proposes activities not to increase the fish production but to promote sustainable development of the fisheries sector through the introduction of resource management measures, and to increase added value with present production volume.

Regarding the resource management, the FRDP proposes to establish a resource management model in closed water body (lagoon area) where it is relatively easy to introduce resource management measures due to limitation of resource users. The FRDP also proposes to increase additional value of catch and decrease post harvest loss through the improvement of quality control (See Figure 7.3.1).

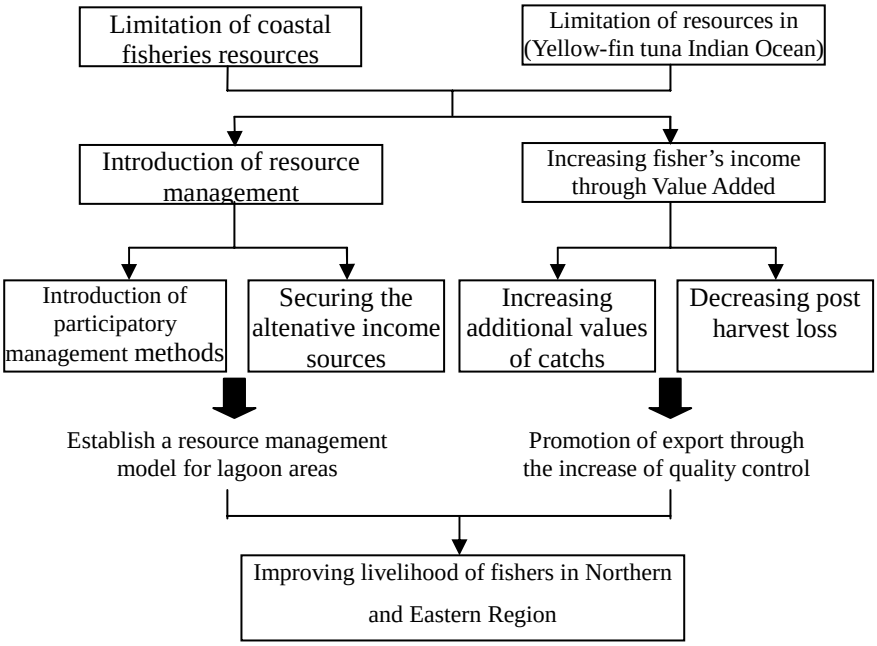


Figure 7.3.1 Concept of the Fisheries Redevelopment Plan

As the short-term development, the FRDP focuses on effective use of the fishing boats, engines, and gears provided by the donor agencies and NGOs to replace those

equipment destroyed by the tsunami. A fish landing facility which is introduced and constructed in the fisheries pilot project, supports the tsunami-affected fishers to restart their fishing activities after transfer from buffer zone to interior area.

7.3.3 Linkage with Other Projects

A large number of donor agencies and NGOs are implementing fisheries projects to recover the fisheries sector in tsunami-affected areas in the Northern and Eastern Region. Some projects plan to rehabilitate or newly develop basic infrastructure for fisheries development in the Region[6]. Three fishing ports in Jaffna, Trincomalee and Batticaloa districts are also planned to be developed / rehabilitated by ADB projects. Particularly, JBIC plans to implement a integrated fisheries development project in Jaffna including a fishing port complex development. It is expected that the deep sea fishing in Jaffna will be promoted and developed when the JBIC project is implemented. In addition, FAO/GTZ also have implemented a pilot project for increasing fish handling at 3 selected areas in Jaffna.

For effective development of the fisheries sector in the Northern and Eastern Region, the Fishers Redevelopment Plan is designed in consideration with linkage of projects mentioned on Table 7.3.1.

Table 7.3.1 Summary of the Fisheries Development Projects by Donor Agencies

Project Name	Outline of the Project	Components to be linked
North-East Coastal Community Development Project (NECCDEP) by ADB	NECCDEP aims sustainable livelihood improvement and sound management of natural resources, and implements .from 2003 to 2009. Project target areas extended from 3 districts in the East to North East as a sub-project of the "Tsunami-affected areas rebuilding project".	Rehabilitation of Cod bay fishing port and Valaichchenai fishing port.
Integrated Fisheries Development Project in the North and East (INFID-NE) by JBIC	The project aims to improve the livelihood of poor coastal communities in the North and East and thereby to, contribute to the stabilization of the region and to promote peace building here. The project consists of promotion of off shore fisheries, coastal fisheries, lagoon fisheries including aquaculture, and market access by FCS. Development of a fishing port complex in Jaffna is also included in the proposal. The project is still in planning stage, and JBIC plans to implement additional survey in 2006.	Fishing port complex development
Pilot Project for Fish Handling and Marketing through the FCS in the Jaffna District by FAO/GTZ	The project aims to increase fish handlings, reduce fish spoilage and improve quality of fish, and to facilitate fishermen / cooperatives to conduct organized marketing of fish, by provision of facilities and equipment. Implementation period was planed from February 2004 to April 2005, but still continued in November 2005.	Co-marketing activities of FCS Unions.

Source: JICA Project Team

[6] Commercial port development project at Oluvil in Ampara is not targeted as precondition of the FRDP due to stagnation of the Commercial port development project.

7.3.4 Development Strategies

(1) Structure of the Development Strategies

Development issues of the Plan consist of four pillars i.e. "Reconstruction of the sector", "Promote sector growth", "Empower poverty reduction", "Strengthening institutional capacities".

Strategic Framework of the plan is shown in Table 7.3.2.

Table 7.3.2 Strategic Framework of the Fisheries Redevelopment Plan for Northern and Eastern Region

Development Issues		Goal	Strategies
Reconstruction	Reconstruction of the sector after the tsunami	1. Greater impact of post tsunami fisheries aids	1.1 Support technical capacity building
			1.2 Support monitoring and evaluation of tsunami-impact
			1.3 Ensure that fisher-folks have equal opportunity to share in the Tsunami-aid
Sustainable Development	Promote sector growth	2. Ensure greater added value and economic benefit for fisheries products.	2.1 Expand export opportunities
			2.2 Promote export-oriented aquaculture
			2.3 Expand domestic markets
	Empower poverty reduction	3. Support for improving livelihood of fishers	3.1 Sustainable use of fishers resources
			3.2 Enhance alternative economic opportunities and quality of life for small scale fisher's family
			3.3 Strengthen financing opportunities
	Strengthening institutional capacities	4. Strengthen institutional capacities	4.1 Improve capacity for technology extension
			4.2 Establish the models for natural resource management
			4.3 Promote accurate information

Source: JICA Project Team

(2) Goals and Strategies

1) Goal 1: Greater Impact of Post-tsunami Fisheries Aid

The number of boats provided by donors exceeded the existed number of boats before the tsunami; new boats were introduced without consideration of the socio-economic and fisheries condition of the areas. As a result, many fishers who did not have boat before the tsunami became boat owners; these newcomers cannot utilize the boats and gears effectively due to lack of experience and fishing skills. In some cases, these assistances may cause negative impacts in the fisheries sector. Additional support is

required for the best use of provided input to decrease the negative impacts. Since many fishers have to relocate to outside of the buffer zone, support for these fishers for restarting their fishing activities also necessary for effective use of the tsunami aid.

Strategy 1.1 *Support technical capacity building*

- Offer technical assistance to fishers who have become boat owners after tsunami for effective use of the fishing boats and gears provided.
- Construct necessary facilities for relocated fishers to restart fishing activities based on the result of the fisheries pilot project at Trincomalee and Ampara.

Strategy 1.2 *Support monitoring and evaluation of tsunami-impact*

- Conduct research to better understand the role and effectiveness of investments and technical assistance for sustaining newly created fisheries communities after the tsunami
- Provide timely and accurate fisheries information regarding to post-tsunami-affected to assist decision making for the Government, donors and NGOs.
- Conduct fisheries census to fully comprehend the effect and impacts of the tsunami

Strategy 1.3 *Ensure that fishers have equal opportunity to share in the Tsunami-aid*

- Strengthening information sharing among donors such as project site, beneficiaries and project components, etc) for avoiding duplication.
- Improving transparency of project implementation procedure by local government such as selection of the beneficiaries, facilities / equipment provided, etc.
- Draw lessons from tsunami assistance into plan for follow-up.

2) Goal 2: Promote Value Added and Economic Benefit for Fisheries Products

Since the coastal fisheries resources are almost over exploited, it is assumed that the growth rate of marine fish production will be stagnant. Thus, fish trade should be strengthened for secure food security of Sri Lanka and improvement of fishers' livelihood in the Northern and Eastern Region. In addition, alternative income sources for coastal fishers should be developed to reduce fishing pressure to coastal resources.

In addition, demand for high value food products tends to increase in domestic market. There are also upstream opportunities in the fisheries sector.

Strategy 2.1 *Expand export opportunities*

- Undertake market research on potential exportable commodities (tuna, shrimp, bottom fish, sea cucumber, etc) and education for traders to access the international markets
- Reduce post-harvest losses of exportable commodities, especially tuna by modernization of

the boat, providing appropriate fish handling technologies and equipment

- Strengthen financial capacity of the society / Idiwara Bank to enable fishers access to equipment and gears for offshore fishing.
- In collaboration with the Board of Investment, update the fish export guidelines
- Improve ice supply condition (particularly in Jaffna)

Strategy 2.2 Promote export-oriented aquaculture

- Strengthen procedures for licensing and inspection systems of aquaculture, especially shrimp culture
- Conduct research, education, and information transfer on disease control.
- Secure the seed supply to shrimp farms in Northern and Eastern Region through the establishment of aquaculture development centre including hatchery and disease control unit.
- Improve farming technology through holding training classes / seminars for fish farmers.

Strategy 2.3 Expand domestic markets for Northern and Eastern Region fisheries products

- Enhance sanitary control and higher quality for fisheries products in Northern and Eastern Region through the establishment of hygienic fish collection points / whole sale market
- Conduct market and economic research to develop value-added processed fish products
- Work with traders to setup outlet shop for value-added new products of Northern and Eastern Region in Colombo

3) Goal 3: Support for Improving Livelihood of Fishers

Due to overexploitation of coastal fisheries resources, it is difficult to increase coastal fisheries production although most of the poor fishers are engaged in coastal fisheries. Therefore, promotion of alternative business for supplemental income source is necessary to improve their income level. The alternative businesses should be considered not only in fishery related items, but also in non fishery related business.

Strategy 3.1 Sustainable use of fishers resources

- Expand research to assess the fisheries resource in coastal and lagoon area for ensuring the development potential.
- Enlighten the necessity of resource management to resource users (fisher, fish trader and other personnel concerned).
- Introducing resource management measures and establish the monitoring system.

Strategy 3.2 Enhance alternative economic opportunities and quality of life for small scale fishers

- Increase outreach of financial institutions (e.g. Fisheries Bank) to encourage access to capital for rural minority business owners.
- Undertake analysis that identifies low investment, technology, employment opportunities and job training
- Expand research to assess the effectiveness of developing profitable alternative business and fish processing that add value to fisheries products and enhance the economic viability of rural communities and families.
- Focus on value-added activities in fisheries and other natural resource industries by encouraging the establishment and growth of locally owned and operated rural businesses.

Strategy 3.3 Strengthen financing opportunities

- Enhance financial activities of FCSs such as loan and cooperative business.
- Support Fisheries Bank to improve financial capacity through training, technical assistance and "best practices" information-sharing.

4) Goal 4: Strengthen Institutional Capacities

DFAR is recruiting and allocating 150 new graduates to DFEOs as FRMA for improving the capacity of DFEO. In addition, 38 FIs are to be recruited for the Northern and Eastern Region. However, DFAR has no training system for staffs including the newly recruited FRMA and FIs, while it depended on donor assistance for training needs.

Strategy 4.1 Improve capacities for technology extension

- Recruit, train, and deploy an inspection workforce with enhanced scientific skills and knowledge at DFEOs.
- Increase training and technical assistance to improve MFAR management in the FRDP.
- Update and complete National Fisheries Policy (2004. Draft)

Strategy 4.2 Establish the models for natural resources management

- Develop co-management models for coastal and lagoon resources
- Develop and implement environmental education programme
- Develop and implement mangrove restoration projects in collaboration with MFAR, local governments, NGO/CBO
- Develop guidance for weighing the short-term risks against the long-term benefits of resources management projects.

Strategy 4.3 Promote accurate data / information collection and compilation

- Develop a comprehensive and integrated base of information system about rural economic

and social conditions that can be used by policymakers for strategic planning, policy development, and programme assessment.

- Establish a regional information and communication structure to disseminate the lessons learn from the tsunami disaster and post-tsunami projects

(3) Areal Strategy

Based on the existing condition of the fisheries sector in each district, FRDP proposes to develop strategies for each district as mentioned below.

1) Jaffna

Jaffna is the main production district of prawn in Sri Lanka. It is also expected that the landing volume of tunas will increase when the fishing port is developed by INFID-NE.

However, fish marketing of Jaffna is not well developed such as insufficient supply of ice, restrictions of fish marketing such as monopolization of marketing of prawn by one entity, unloading and loading at security check points, etc. It is indispensable to remedy these conditions for fisheries development.

Regarding the relaxation of restrictions, there is a case of a FCS Union in Jaffna that has removed its restriction on prawn marketing through the negotiation with LTTE. Therefore, it is possible that the capacity building of FCS will lead to removal or easing of restrictions and improving development condition in fisheries sector. However, although the INFID-NE by JBIC proposes to improve marketing, targets of the INFID-NE is individual FCSs.

Therefore, FRDP proposes to expand export opportunities and domestic market through the improvement of the marketing system including handling and quality control of tuna which will be necessary when fishing port is developed in future.

Jaffna also has 400 ha of land that is potentially suitable for aquaculture. This land also will be developed after establishing aquaculture technology in Northern and Eastern Region.

2) Killinochchi

Killinochchi also produces high marketable fish such as prawns and rock fishes, although the production volume is small. In addition, Killinochchi also has similar problems with fish marketing as Jaffna.

Therefore, FRDP proposes to expand export opportunities and domestic market through the improvement of the marketing system of Killinochchi as a part of project in Jaffna.

3) Mullative

Yellow-fin migrates off shore from Ampara to Mullative seasonally. Off shore of Mullative district is a fishing ground for tuna long line, and fishing boats come from other districts, particularly from Trincomalee. However, fishers in Mullative do not conduct tuna long line due to lack of skills, knowledge and equipments.

Therefore, FRDP proposes to expand export opportunities through the promotion of tuna long line including quality control for export purpose.

Mullative also has 800 ha of land that is potentially suitable for aquaculture. This land also will be developed after establishing aquaculture technology in the Northern and Eastern Region.

4) Trincomalee

Trincomalee has a cod bay fishing port where the multi-day boats land their catches. The main targets of the multi-day boats are yellow-fin. In addition, FRP boats in the Northern area of Trincomalee also conduct tuna long line. However, due to inappropriate quality control and fish handling, yellow-fins from Trincomalee are rejected by exporters in Colombo. Particularly, quality of catches by FRP boats is low due to no ice storage on the boats.

Therefore, FRDP proposes to expand export opportunities through the promotion of tuna long line including modification of FRP fishing boat and quality control for export purpose.

5) Batticaloa

Lagoon fishery is one of the important sub-fisheries sector in Batticaloa. However, the lagoon fisheries face illegal fishing activities and over exploitation of fisheries resources. Eastern University which is implementing environmental assessment in Batticaloa Lagoon reported that there were 5 species already endangered (i.e. *Siganus sp* and *Eleutheronema sp*, etc.). However, there is no action taken by government side although the District Environmental Enforcement Committee in Batticaloa emphasizes the control of illegal fishing.

FRDP proposes to establish resource management system including measures for improving livelihood such as promotion of export-oriented aquaculture and enhancing alternative economic opportunity as alternative income sources for fishers who participate in the resource management activities.

According to the DFEO Batticaloa, there are some displaced fishing communities due to the tsunami. These fishers' households will move to the interior side, and need to develop the fishing facilities at the beach.

6) Ampara

Ampara has no appropriate land for fishing port. Day boats operating in Kalumunai moor along coastal area and their catches are landed by canoes. In this condition, fishing boats could not take ice for fishing although Ampara produced about 1,600 ton of yellow-fin in 2004. Therefore, FRDP proposes to expand export opportunities through promotion of tuna long line including modification of FRP fishing boat and quality control for export purpose.

Southern part in Ampara also has land that is potentially suitable for aquaculture. This land also will be developed after establishing aquaculture technology in the Northern and Eastern Region.

According to the DFEO Ampara, there are some displaced fishing communities due to the tsunami. These fishers' households will move to the interior side, and need to develop the fishing facilities at the beach.

(4) Prioritized Strategies by Districts

Prioritized strategies by districts are determined based on the development strategies and areal strategies aforementioned.

Regarding the reconstruction of the sector, DFEOs reported about the displaced fishers' villages in Batticaloa and Ampara. As a short-term redevelopment, fisheries facilities for displaced fishers should be developed to restart their fishing activities, and technical support for effective use of tsunami aids should also be provided. Therefore, FRDP gives priority for reconstruction to these displaced villages in Batticaloa and Ampara.

For ensuring greater added value and economic benefit, improvement of tuna longline has the possibility since the beach price of exportable yellow-fin is twice as high as the yellow-fin for domestic consumption (i.e. beach price of exportable yellow-fin is more

than Rs 200 /kg while the unexportable yellow-fin is sold about Rs 100/kg). Tuna longline is one of major fishing of FRP boats in the northern part of Trincomalee, but about 50% of yellow-fin tuna caught by FRP boats could not be exported due to low quality. It is expected to increase the value of yellow-fin through the improvement of quality control.

Jaffna also has potential for increasing additional value of their catches. Jaffna produces about 3,600 ton of dried fish due to insufficient supply of ice and low accessibility. It is expected that fishers income increase if they can sell these fish as fresh fish. This would be realized through the establishment of fish collection network with ice supply.

Since the Batticaloa lagoon faces overexploitation of fisheries resources, improving livelihood of lagoon fishers through the sustainable use of lagoon resources is required. As described earlier, fisheries resources in Batticaloa Lagoon has been decreased, and some important species (*Siganus sp*, *Eleutheronema sp*, etc) were endangered. In view of this situation, resource management activities should be started in Batticaloa Lagoon. Promotion of alternative business for supplemental income source also should be considered to reduce the fishing pressure to lagoon resources.

Regarding the strengthening institutional capacity, it should be conducted in all districts since all DFEO have poor institutional capacity as mentioned previously. The prioritized strategies by districts aforementioned are summarized in Table 7.3.3.

Table 7.3.3 Prioritized Strategy by District

	Greater impact of post tsunami fisheries aids	Ensure greater added value and economic benefit		Support for improving livelihood of fishers	Strengthen institutional capacities
		Expand export opportunity (Yellow-fin tuna)	Expand export opportunity and domestic market		
Jaffna	○		◎	○	◎
Killinochchi	○		◎	○	◎
Mullative	○	○		○	◎
Trincomalee	○	◎		○	◎
Batticaloa	◎	○		◎	◎
Ampara	◎	○		○	◎

Source: JICA Project Team

7.4 Priority Projects for Early Implementation

7.4.1 Formulation of Priority Projects

In line with the strategies aforementioned, priority projects for redeveloping fisheries

sector in Northern and Eastern Region are formulated to utilize limited financial and human resources effectively. Each priority project is designed based on strategies shown in Table 7.4.1.

Table 7.4.1 Priority Projects and Strategies

Priority Projects	Strategies
1. Redevelopment of Tsunami affected fisheries facilities	1.1 Support technical capacity building 1.2 Support monitoring and evaluation of tsunami impact
2. Strengthening of fish market 2-1 Improvement of quality control for Off-shore and Deep Sea Fisheries 2-2 Improvement of Fish Marketing System	2.1 Expand export opportunities 2-3 Expand domestic market
3. Promoting Sustainable Fisheries Community Development through Resources Management	2.2 Promote export-oriented aquaculture 3.1 Sustainable use of fishers resources 3.2 Enhance alternative economic opportunities and quality of life for small scale fishers 3.2 Strengthen financing opportunities 4.2 Establish models for natural resource management
4. Improve Institutional Support Services	1.2 Support monitoring and evaluation of tsunami impact 1.3 Ensure fishers have equal opportunity to share in the Tsunami-aid 4.1 Improve capacity for technology extension 4.3 Promote accurate data / information collection and compilation

Source: JICA Project Team

Priority projects are designed to be applied to the areas where high impacts are expected in due consideration of the development strategy and areal strategy aforementioned.

Although “Improvement of quality control for Off-shore and Deep Sea Fisheries Project” and “Improvement of Marketing System Project” are designed based on same strategies, they have different components due to the varying potential in the target areas.

7.4.2 Project 1: Redevelopment of Tsunami Affected Fisheries Facilities

(1) Project Objectives

The project aims to support Tsunami affected fishers for restarting their fishing activities. Target of the project consists of two groups, i.e. 1) relocated fishers to new settlements away from the beach, and 2) fishers who have received new fishing gears after the tsunami.

The fisheries pilot project that aims to support relocated fishers for restarting their fishing activities is being implemented in Ampara and Trincomalee This pilot project consists of support of fishing activities through the construction of landing facilities and provision of fishing gear, management capacity building of FCSs, and monitoring. Results of the pilot project will be reflected in the project component from following viewpoints.

- Management model of the landing facilities
- Business model operated by FCS's
- Problems FCSs facing to, and counter measures to the problems

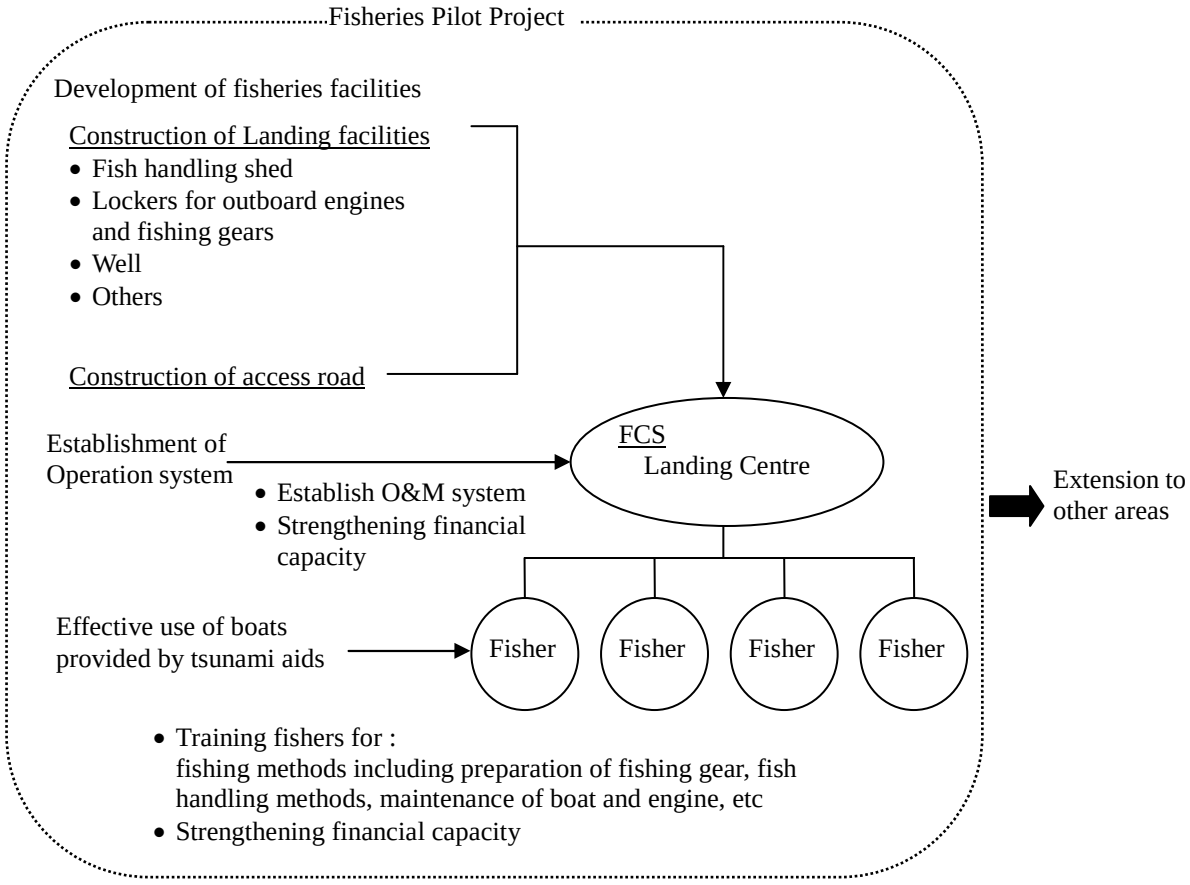


Figure 7.4.1 Concept of Redevelopment of Tsunami Affected Fisheries Facilities

(2) Project Areas and Potential Areas for Extension

According to the DFEO Batticaloa and Ampara, fishers households in the following villages will move to interior sides, and need fisheries facilities for restarting their

fishing activities (see Table 7.4.2).

Table 7.4.2 Project Sites for Developing Fisheries Facilities

	F.I. Division	Landing centre	No. of FRP	Note
Batticaloa	Vaharai	Vaddwan	11	CARE International plans to construct permanent houses, but no landing facilities.
	Valaichchenai	Kalmade Kirimitty	10	Community will move to high land side in same area. No project is planed in this site.
	Manmunai North	Palameenmadu	37	Fishers in Navalady want to use landing site at Palameenmadu after moving to new houses located interior side. FAO studies feasibility of new landing site development at Palameenmadu.
	Manmunaipattu	Palamunai	35	Sewalanka constructed a community centre for FCS. Community will move to high land side in same area.
	Kaluwanchikudy	Cheddipalayam -Beach	20	Sewalanka constructed a community centre for FCS. Community will move to high land side in same area.
Ampara	Pottuvil	Komari	10	Community will move to high land side in same area.
	Pottuvil	Sinna ullai	22	Community move to opposite side of the main road (inland side).
	Pottuvil	P Kudhckalli		FAO studies feasibility of new project. Community will move to high land side in same area.
	Pottuvil	Jalaldeen puram	14	Community will move to high land side in same area. No project is planed in this site.

However, an additional survey is necessary to confirm the number of fishers and boats, necessary facilities for designing scale of landing facilities, due to modification in the relocation of tsunami-affected people after reducing the buffer zone on December 2005. Therefore, detail conditions of landing sites should be confirmed after completion of the relocation projects.

The proposed project areas and potential areas for extension of the project activities are shown in Table 7.4.3 and Figure 7.4.2.

Table 7.4.3 Potential Areas for Redevelopment of Tsunami Affected Fisheries Facilities

Component	Jaffna	Kilinoch-chi	Mulativu	Trincoma-lee	Batticaloa	Ampara
Development of fisheries facilities					◎	◎
Establishment of management system					◎	◎
Effective use of equipment provided by tsunami aids	○	○	○	○	◎	◎

Note : ◎ : Project area, ○ : Potential areas
Source: JICA Project Team

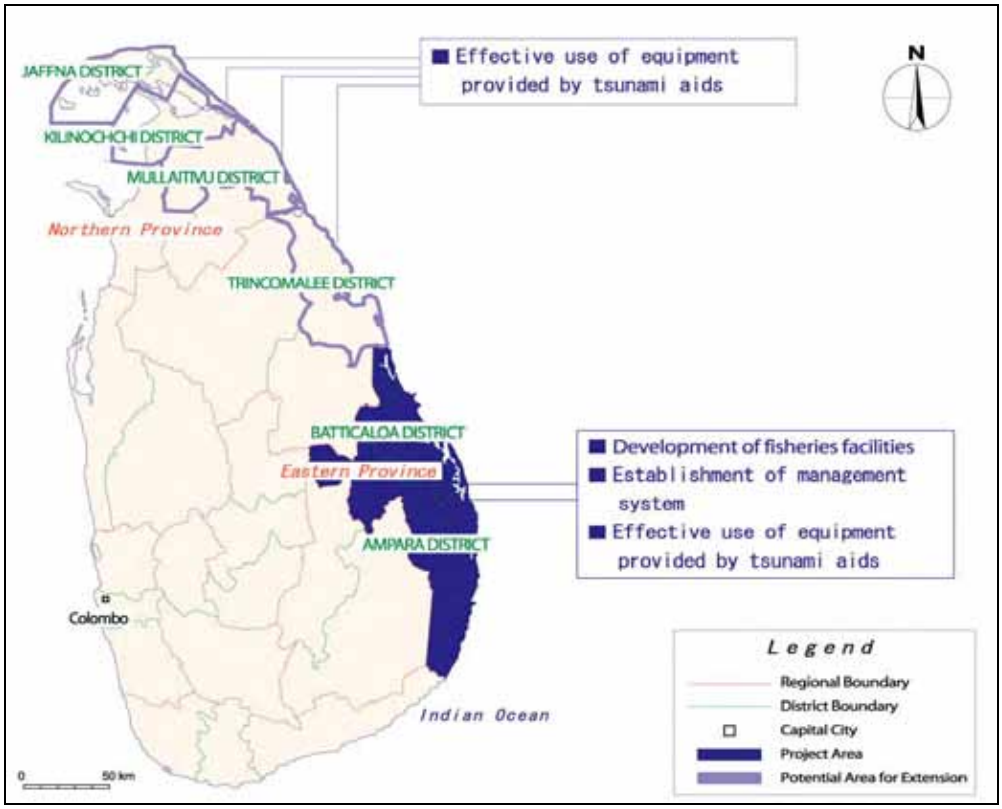


Figure 7.4.2 Potential Areas for Redevelopment of Tsunami Affected Fisheries Facilities

(3) Project Components

Project consists of 3 outputs, i.e. development of fisheries facilities, establishment of management system of the fisheries facilities by FCSs, and effective use of equipment provided by tsunami aids. Activities for achieving these outputs are as follows;

Output 1: Fisheries facilities are developed at landing sites where the fishers moved to interior sides using.

Activities 1;

1.1 Fishing condition of selected sites (number of fishers and FRP boats, existing and planned facilities, land availability, necessity of the locker、etc) is studied.

1.2 Design of landing facilities are modified through the discussion with beneficiaries.

1.3 Facilities are constructed.

Output 2 : Fisheries facilities are managed by FCSs.

Activities 2;

2.1 Facility management unit is organized in the FCS.

2.2 Rules and regulations, operation and management system is determined by the management unit.

2.3 Facilities are managed by the management unit

Output 3 : Equipment (boat, engine, fishing gear, etc) provided by tsunami aid are well utilized / maintained.

Activities 3;

3.1 Needs assessment for new boat owners who do not have sufficient experience and fishing skills is conducted.

3.2 Technical training courses for the new boat owners are designed.

3.3 Technical training courses (fishing method, fish handling, and maintenance of boats and engines) are held through the FCSs.

Main inputs

Experts: Fisheries development, Architect

Construction of lockers, landing facilities and other necessary facilities

Budgets for training of FIs and fishers

7.4.3 Project 2: Strengthening of Fish Marketing

Strengthening of fish marketing consists of 2 sub projects, namely “Improvement of Quality Control for Off-Shore and Deep Sea Fisheries” and “Improvement of Fish Marketing System”.

(1) Project 2-1 : Improvement of Quality Control for Off-Shore and Deep Sea Fisheries

1) Project Objectives

This project aims to enhance the profitability of fisheries through the improvement of onboard and onshore handling methods for increasing tuna export.

Yellow-fin tuna migrates off shore from Ampara to Mullative seasonally, and many day boats and FRP boats in these area targets Yellow-fin. However, due to the low quality of fish, only few portions of catches by FRP boats are suitable for export. The main target of the project is fishers who engage tuna long line using FRP boat, but fishers using day boats and multi-day boats are also included for improving fish handling technology.

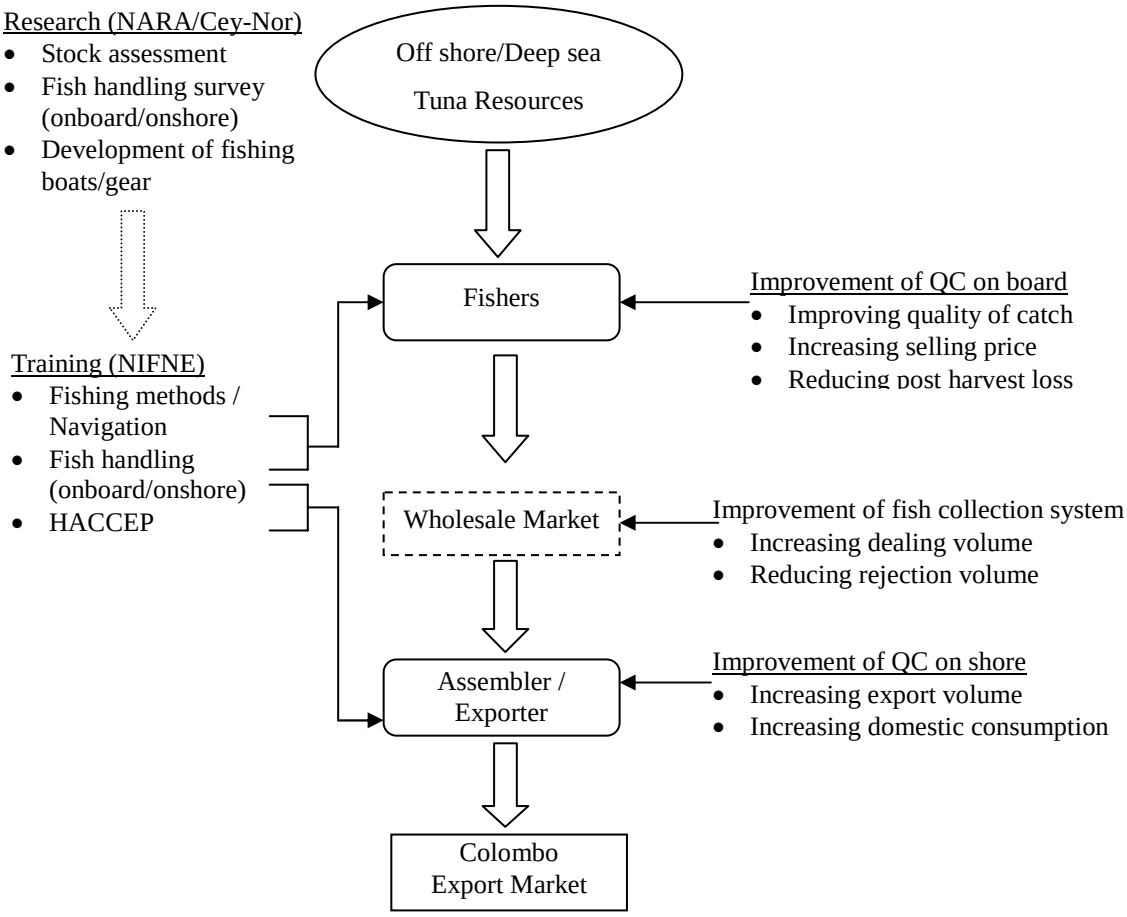


Figure 7.4.3 Concept of Promoting off-shore and Deep Sea Fisheries

2) Project Areas and Potential Areas for Extension

The project targets northern part of Trincomalee and the wholesale market in Trincomalee Town.

Tuna long line by FRP boat is very active in the northern area of Trincomalee. It is estimated about 1,000 ton of tunas were caught by FRP boats in 2004. However, most of the catches of the boats could not be exported due to the low quality caused by improper handling / preservation practices. This situation should be improved for increasing the income level of fishers. Since Trincomalee district has a relatively high number of FRP boats operating tuna long line, it is expected to have the highest effect of the project.

Tuna longline fishing is also implemented by some FRP boats in Batticaloa and Ampara. The project will be applied to these districts. In addition, Mullative which locates nearest to main tuna fishing ground also have development potential too. Jaffna also has large potential and needs to develop fish marketing. This will be taken by the

"priority project 3 : Improvement of Fish Marketing System" since the difference of fishing activities and development potential.

Proposed project areas and potential areas for extension of the project activities are shown in Table 7.4.5 and Figure 7.4.4.

Table 7.4.4 Potential Areas for Improving QC for Off-Shore and Deep Sea Fisheries

Component	Jaffna	Kilinoch-chi	Mulativu	Trincoma-lee	Batticaloa[*2]	Ampara
Improvement QC on board	○		○	◎	○	○
Improvement QC on Shore	○		○	◎	○	○
Improvement fish collection and distribution system	○			◎		
Study of tuna resource				◎		

Note: ◎ : Project areas, ○ : Potential areas
Source: JICA Project Team

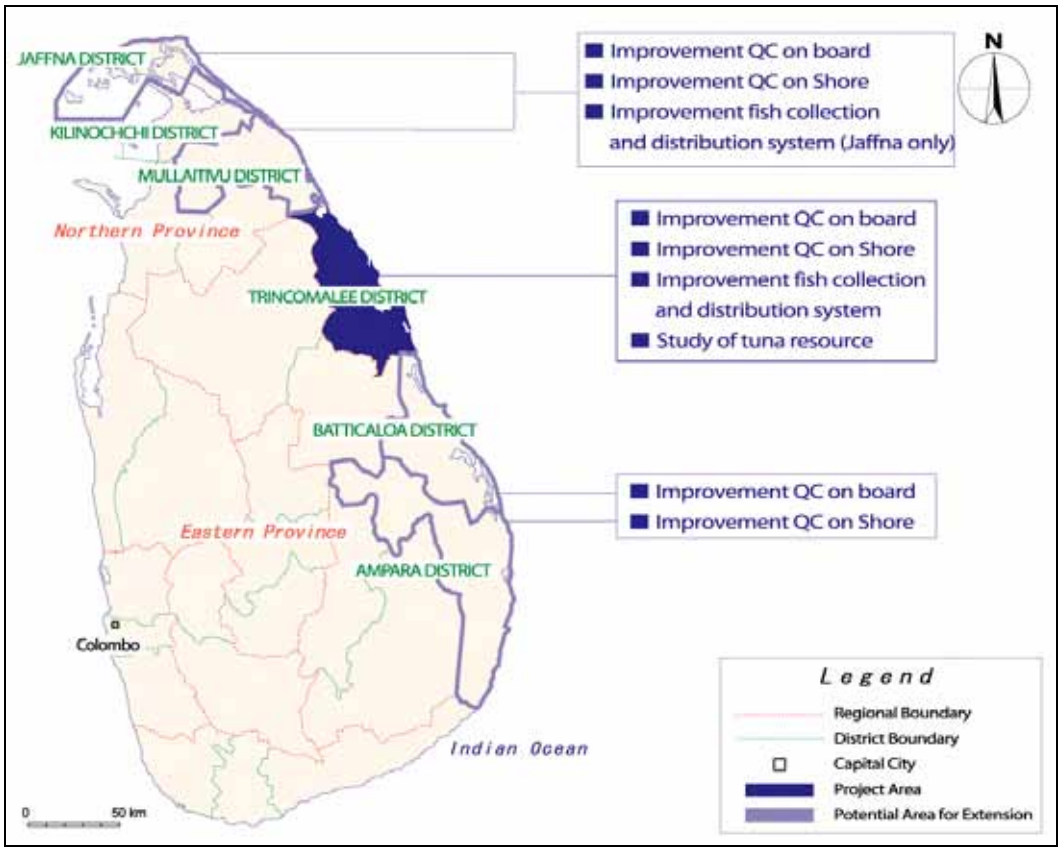


Figure 7.4.4 Potential Areas for Improving QC for Off-Shore and Deep Sea Fisheries

3) Project Components

The project consists of 4 parts, i.e. improvement of quality control on board, improvement of quality control on shore, improvement of fish collection and

distribution system, study of resource condition of tunas in NER. Activities for achieving these outputs are as follows;

Activities 0;

0. Project management unit is organized by DFEO, Cey-Nor, NARA, and private sector including tuna traders.

Output 1: Quality control on board is improved.

Activities 1;

1.1 DFEO surveys problems of tuna fishing including QC on board.

1.2 Necessary technologies (including new type of boat) for tuna fishing are developed.

1.3 Training for extending new fishing technologies are held for fishers.

1.4 New type fishing boats and gears are expanded through the FCSs.

Output 2: Quality control on shore is improved.

Activities 2;

2.1 DFEO (regional officer form QC department) surveys hygienic condition of main landing centres for confirming problems of post harvest QC of tunas.

2.2 Develop the QC improvement technologies including HACCEP

2.3 Training for extending new QC technologies are held for fish traders.

Output 3: Fish collection and distribution system is improved.

Activities 3;

3.1 Ice distribution and fish collection system which centreed on the fish wholesale market is established.

3.2 Fish wholesale market is rehabilitated for strengthening tuna dealing capacity.

3.3 Ice storages are constructed at main landing centres.

3.3 The wholesale market is managed by traders society under supervision of the Municipal Council.

Output 4: Resource condition of tunas in NER is grasped.

Activities 4;

4.1 Landing data of tunas is collected at main landing sites.

4.2 Sampling survey for CPUE is conducted.

4.3 International and domestic demand of tunas is studied.

4.4 Necessity of tuna resource management is studied.

Main inputs

Experts: Fisheries development, Quality Control, boat designing, etc.

Construction of Trincomalee wholesale fish market, ice storages, new type of FRP boat (including mould)

Budgets for Training for fishers and traders

(2) Project 2-2: Improvement of Fish Marketing System

1) Project Objectives

The project aims to improve the marketing condition through the establishment of the marketing system by FCS federation and improving fish handling technology in Jaffna and Kilinochchi.

As mentioned previously, JBIC plans to implement INFID-NE in Jaffna. This project, improvement of the marketing system in Northern districts, is designed to improve the effect of INFID-NE by strengthening marketing capacity of FCS federation and establish fish marketing system covering the whole district.

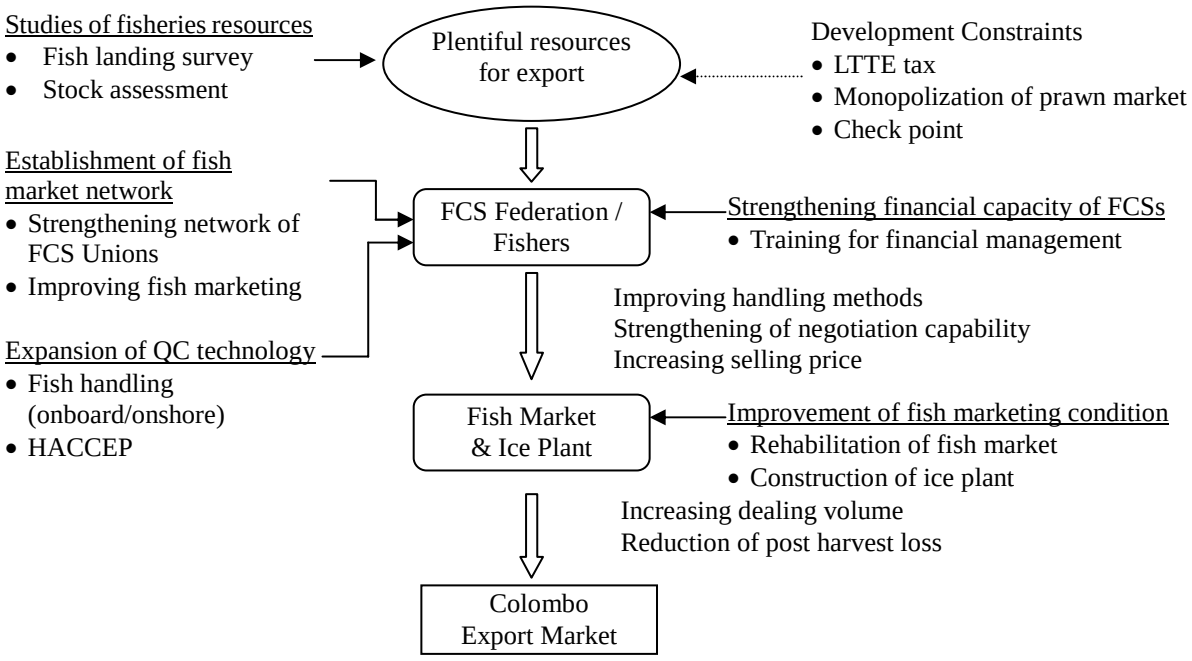


Figure 7.4.5 Concept of Improvement of Fish Marketing System

2) Project Area

The project targets Jaffna district. Jaffna produces the largest volume of fish in the Northern and Eastern Region. However, it has physical and political development constraints such as insufficient ice supply, time and cost loss at check point to Colombo, etc. Therefore, the highest effect of the project is expected in Jaffna.

The project starts in Jaffna at first, and will expand the activities to Kilinochchi which is located on the way from Jaffna to Colombo. Proposed project areas and potential

areas for extension of the project activities are shown in Table 7.3.7 and Figure 7.3.6.

Table 7.4.5 Potential Areas for Improvement of Fish Marketing System

Component	Jaffna	Kilinoch-chi	Mulativu	Trincoma-lee	Batticaloa	Ampara
Establishment of fish market network	◎	○				
Improvement of fish marketing condition	◎					
Expansion of QC technology	◎	○				
Strengthening of financial capacity of FCS	◎	○				
Studies of fisheries resource condition	◎	○				

Note: ◎ : Project areas, ○ : Potential areas
Source: JICA Project Team

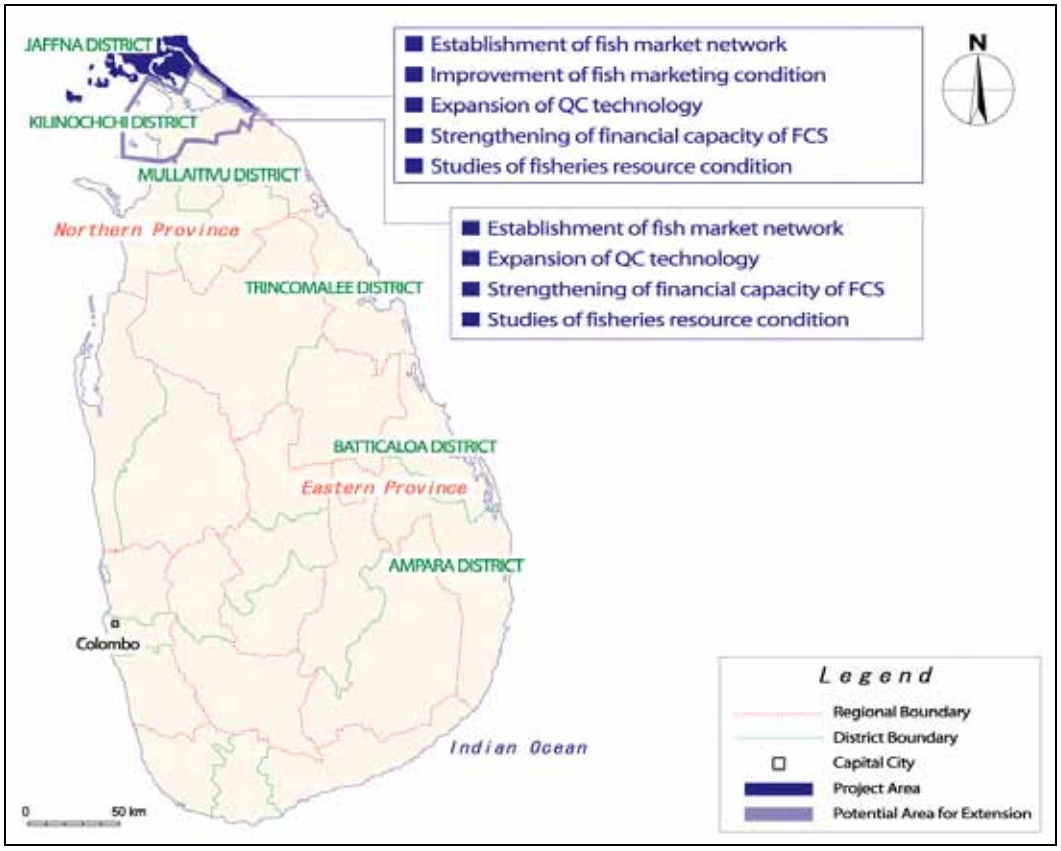


Figure 7.4.6 Potential Areas for Improvement of Fish Marketing System

3) Project Components

The project consists of 5 parts, i.e. establishment of fish market network, improvement of fish marketing condition, expansion of quality control technology, strengthening of financial capacity of FCS, studies of fisheries resource condition in Jaffna. Activities

for achieving these outputs are as follows;

Output 1: FCS Federation establishes fish market network in Jaffna.

Activities 1;

1.1 Main landing centres which have marketing problems are selected through the fish marketing survey.

1.2 Fish collection system covering landing centres in rural area is designed.

1.3 Fishers in the selected landing centres are trained for onboard fish handling method, set net fishing, off-shore line fisheries, etc.

1.4 Training for fish handling/transportation methods and HACCEP is held for FCS Federation.

Output 2: Fish marketing condition is improved.

Activities 2;

2.1 Fish market is rehabilitated as fish collection centre in Jaffna.

2.2 Ice plant is constructed.

2.3 Insulate trucks for ice distribution are procured.

2.4 Ice is distributed to main landing centres in the marketing network.

Output 3: Quality control (QC) technology is expanded.

Activities 3;

3.1 Hygienic condition and QC condition on board / on shore are surveyed.

3.2 Quality control technologies (onboard / onshore / transportation) are developed.

3.3 Training for extending new technologies are held.

Output 4: Financial capacity of FCS is strengthened.

Activities 4;

4.1 Financial condition of FCSs in the marketing network is studied.

4.2 Training for financial management of FCS is held.

4.3 Activities of FCS are monitored.

Output 5: Fisheries resource condition in Jaffna is grasped.

Activities 5;

5.1 Landing data at main landing centres are collected and analyzed.

5.2 Condition of coastal and off shore resources are studied.

5.3 Further development plan is prepared based on the survey result.

Main inputs

Experts: Fish marketing, Quality control, Fisheries organization, etc.

Construction of a fish market, ice plant and insulate trucks

Budgets for training for QC, training for financial capacity building for FCSs and landing survey

7.4.4 Project 3: Promoting Sustainable Fisheries Community Development through Resources Management

(1) Project Objectives

To enhance the livelihood of small scale fishers and their communities through the sustainable utilization of lagoon resources

The Project aims to develop the model of "Sustainable livelihood approach" and "Resources (Lagoon) co-management" for the Northern and Eastern Region

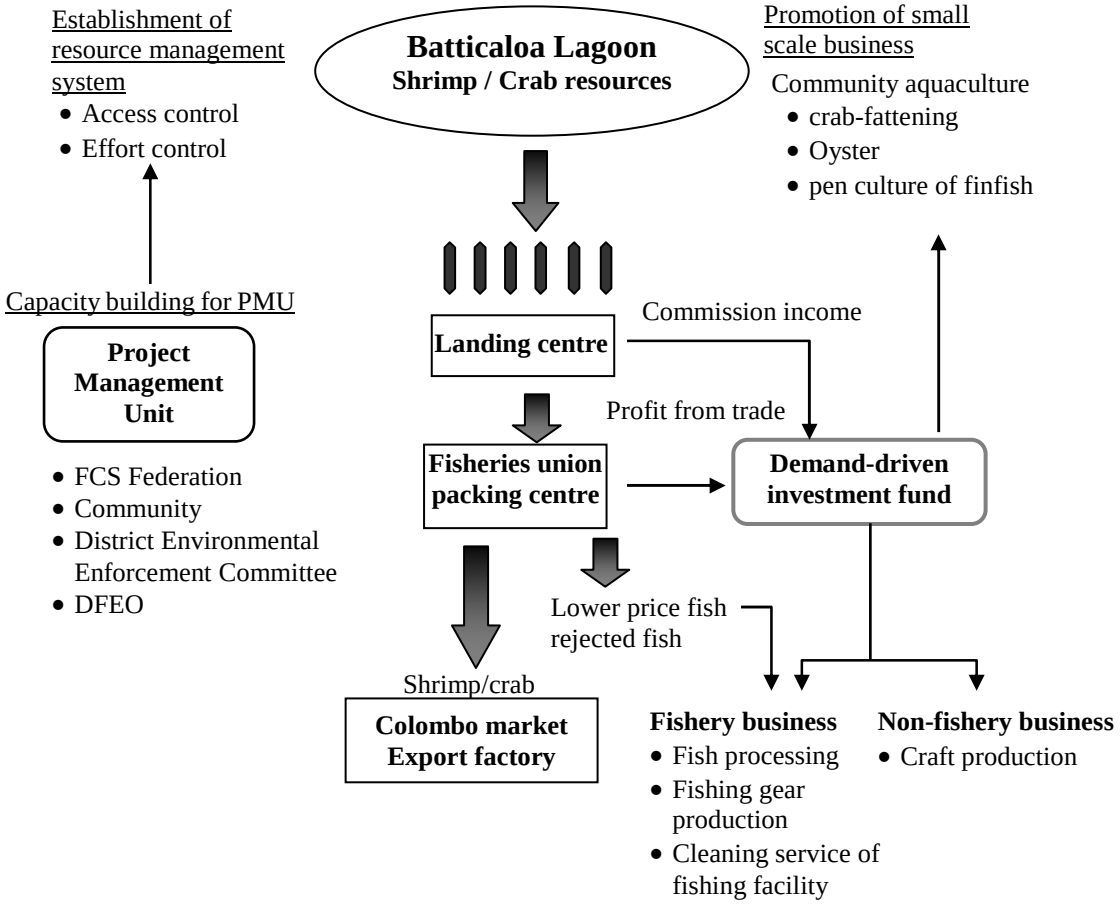


Figure 7.4.7 Concept of Promoting Sustainable Fisheries Community Development through Resources Management

(2) Project Area

The project targets Batticaloa lagoon which faces overexploitation of resources and illegal fishing activities.

These activities will be expanded to other districts since lagoon fishing is commonly conducted in all districts

Proposed project areas and potential areas for extension of the project activities are shown on Table 7.4.9 and Figure 7.4.8.

Table 7.4.6 Potential Areas for Promotion of Sustainable Fisheries Community Development

Component	Jaffna	Kilinoch-chi	Mulativu	Trincoma-lee	Batticaloa	Ampara
Establishment of resources co-management system	○	○	○	○	◎	○
Activation of small scale business	○	○	○	○	◎	○
Capacity building of the PUM	○	○	○	○	◎	○

Note : ◎ : Project areas, ○ : Potential areas
Source: JICA Project Team

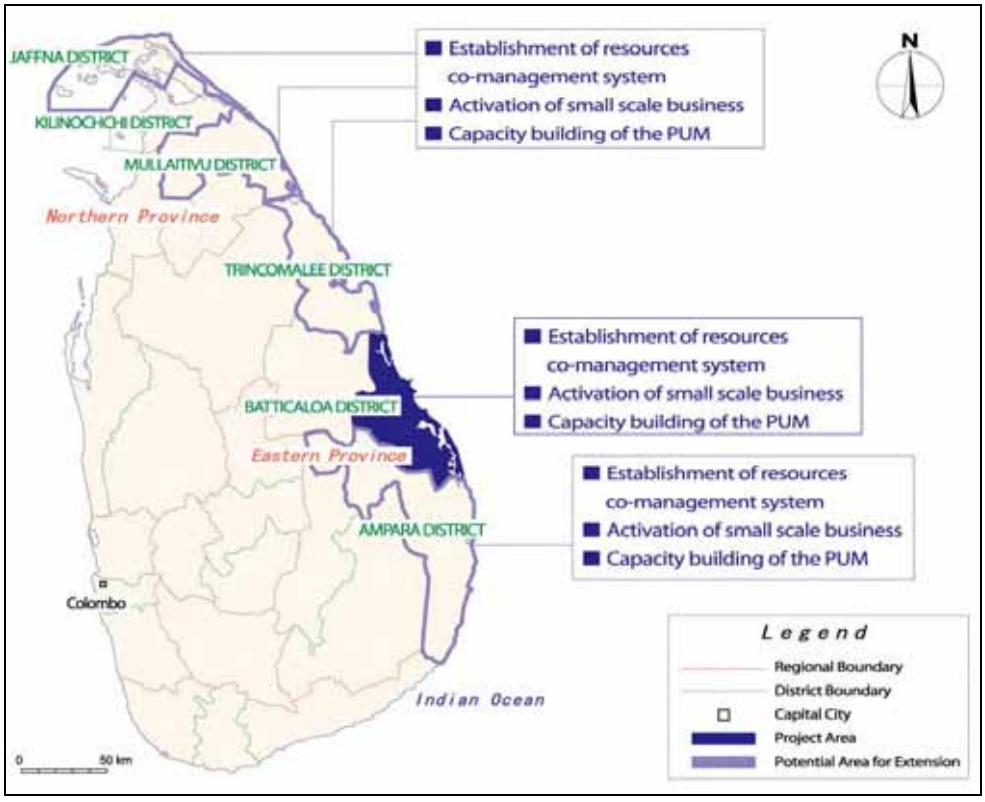


Figure 7.4.8 Potential Areas for Promotion of Sustainable Fisheries Community Development

(3) Project Components

Project consists of 3 parts, i.e. Establishment of resources co-management system, activation of small scale business, capacity building of the project management unit (PMU). Activities for achieving these outputs are as follows;

Activities 0;

0 PMU is organized (DFEO, District Environmental Enforcement Committee, FCS Federation, Eastern Univ. Police)

Output 1: Resources co-management system is established.

Activities 1;

1.1 Landing data is collected at major landing centres in the Lagoon.

1.2 Sampling survey for CPUE is conducted.

1.3 Priority sites for resource management are selected (proposed first priority site is lagoon mouth area) through the participatory workshop.

1.4 Set up the fishing prohibited period and areas and monitoring unit is organized by related people / organizations.

1.5 Illegal fishing activities is watched by the monitoring unit.

Output 2: Small scale business in fisheries and off-fisheries is activated.

Activities 2;

2.1 Possible activities for supplemental income source (such as Crab fattening, oyster culture, pen culture etc) are selected by participatory workshop at the priority sites for resource management.

2.2 Selected activities are implemented by FCSs as pilot projects.

2.3 Financial capacity of FCSs is strengthen (Establishment of fishery bank, financing committee to link formal financial institution, etc).

2.4 Project activities are expanded by assistance of FCSs.

Output 3: PMU acquires capability to continue the project activities.

Activities 3;

3.1 Workshops are held for empowering the stakeholders, particularly FCSs and FCS unions.

3.2 Develop guideline for introducing supplemental income activities for community people such as aquaculture and fish marketing, etc.

3.3 PMU prepares the extension plan of the project activities to other FCSs along the Batticaloa Lagoon..

Main inputs

Experts: Community development, Fish marketing, Aquaculture, Fisheries organization, etc.

Construction of ponds for crab culture

Budgets for workshop and training for small scale business, initial investment for small scale business, and landing survey

7.4.5 Project 4: Improve Institutional Support Services

(1) Project Objectives

The objective is to improve the capacities of DFEO and related agencies. Since negative impacts by the tsunami aids is one of the issues among stakeholders, necessary surveys and workshops are implemented in cooperation with FAO.

The concept of the project is as illustrated below.

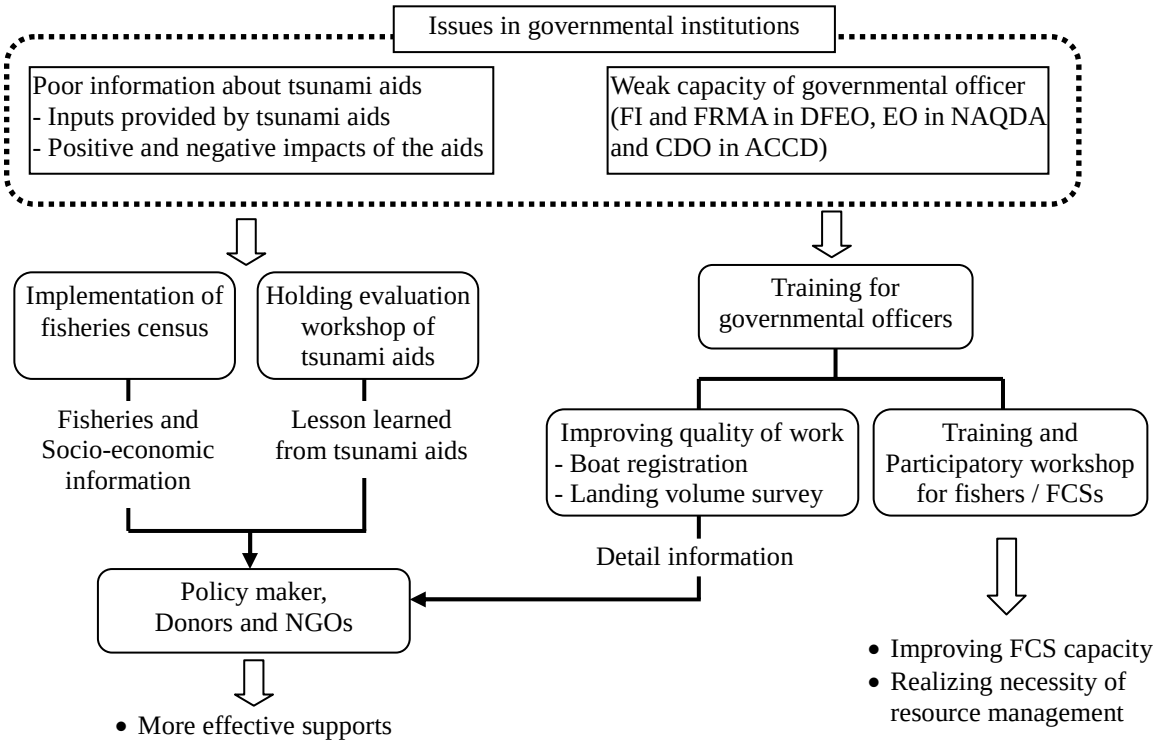


Figure 7.4.9 Concept of Improve Institutional Support Services

(2) Project Area

The project covers all districts in the Northern and Eastern region (see Table 7.4.11).

Table 7.4.7 Proposed Project Areas for Improving Institutional Support Services

Component	Jaffna	Kilinoch-chi	Mulativu	Trincoma-lee	Batticaloa	Ampara
Improved accuracy of fisheries information	◎	◎	◎	◎	◎	◎
Improved fisheries extension system	◎	◎	◎	◎	◎	◎
More effective use of inputs by tsunami aid	◎	◎	◎	◎	◎	◎

Note : ◎ : Project areas,
Source: JICA Project Team

(3) Project Components

The Project will include the following three components: 1) Capacity Building and 2) Improvement of training facility and 3) Post-tsunami Evaluation Study of the Sector.

Project consists of 3 parts, i.e. improved accuracy of fisheries information, improved fisheries extension system, more effective use of inputs by tsunami aid. Activities for achieving these outputs are as follows;

Activities 0;

0 Project management unit consists of six DFEOs is organized.

Output 1: Accuracy of fisheries information collected by DFEO is improved.

Activities 1;

1.1 Needs assessment for DFEO / FIs is implemented.

1.2 Short-term training courses based on the institutional needs assessment are implemented.

1.3 Registration system of fishers and fishing boats is improved.

1.4 Landing survey system is improved.

Output 2: Fisheries extension service is improved.

Activities 2;

2.1 Needs of fishers / FCSs is studied through the participatory workshop.

2.2 Training courses for fishers / FCSs are held in cooperation with NAQDA and NIFNE..

2.3 Supplement the “FSC management” as an extension subject of FIs and DFEO.

Output 3: Inputs by tsunami aid is used more effectively.

Activities 3;

3.1 Existing condition of fisheries sector such as number of fishers and fishing boats is grasped through the implementation of fisheries census.

3.2 Hold the evaluation workshops / seminar for tsunami related projects in cooperation with related donors and NGOs.

3.3 Necessary countermeasures are taken for solving negative impact of tsunami aids.

3.4 Strategy for effective use of inputs by tsunami aid is prepared based on the lesson learned from the tsunami related projects.

Main inputs

Experts: Fisheries development, Statistics, Training/education, etc.

Construction of ponds for crab culture

Budgets for training and workshop, fisheries census and evaluation workshop

7.5 Implementation Arrangement and Schedule

7.5.1 Implementing Organizations

Ministry of Fisheries and Aquatic Resources (MFAR) takes responsibility and provide necessary coordination for the FRDP.

MFAR will establish a Central Programme Coordination Unit (PCU) with tasks including the following:

(i) Selection of personnel needed to implement the FRDP, and carry out budgetary planning and control for the FRDP.
(ii) Coordinate the work schedule of the FRDP and Projects, secure capital, and efficiently distribute human resources.
(iii) Designate and dispatch technical experts (local and/or international) to assist with the activities of the Action Plan as needed.
(iv) Carry out monitoring and evaluation activities with the cooperation of District Committees to implement the Projects, and revise and make changes as needed to resolve problems that arise.

Each project will be implemented and supervised by the agencies listed in Table 7.5.1

Table 7.5.1 Responsible Organization for FRDP

	Redevelopment of Tsunami Affected Fisheries Facilities	Promotion of Off-Shore and Deep Sea Fisheries	Improvement of Marketing System	Sustainable Fisheries Community Development	Improve Institutional Support Services
Supervision	MFAR	MFAR	MFAR	MFAR	MFAR
Implementation	DFEO	DFEO, NARA, Cey-Nor	DFEO, NARA	DFEO, DEEC	DFEO, NIFNE
Partnership		NIFNE	NIFNE	NARA, NAQDA, CCD	ACCD

Source: JICA Project Team

7.5.2 Cost Estimate

The cost of the priority projects is estimated at around US$20.7 million as summarized below.

Table 7.5.2 Preliminary Cost Estimation

Project	Cost (million US$)
Redevelopment of Tsunami Affected Fisheries Facilities	2.4
Promotion of Offshore and Deep Sea Fisheries	5.7
Improvement of Fish Marketing System	5.4
Sustainable Fisheries Community Development through Resources Management	5.9
Improve Institutional Support Services	1.3
Total	20.7

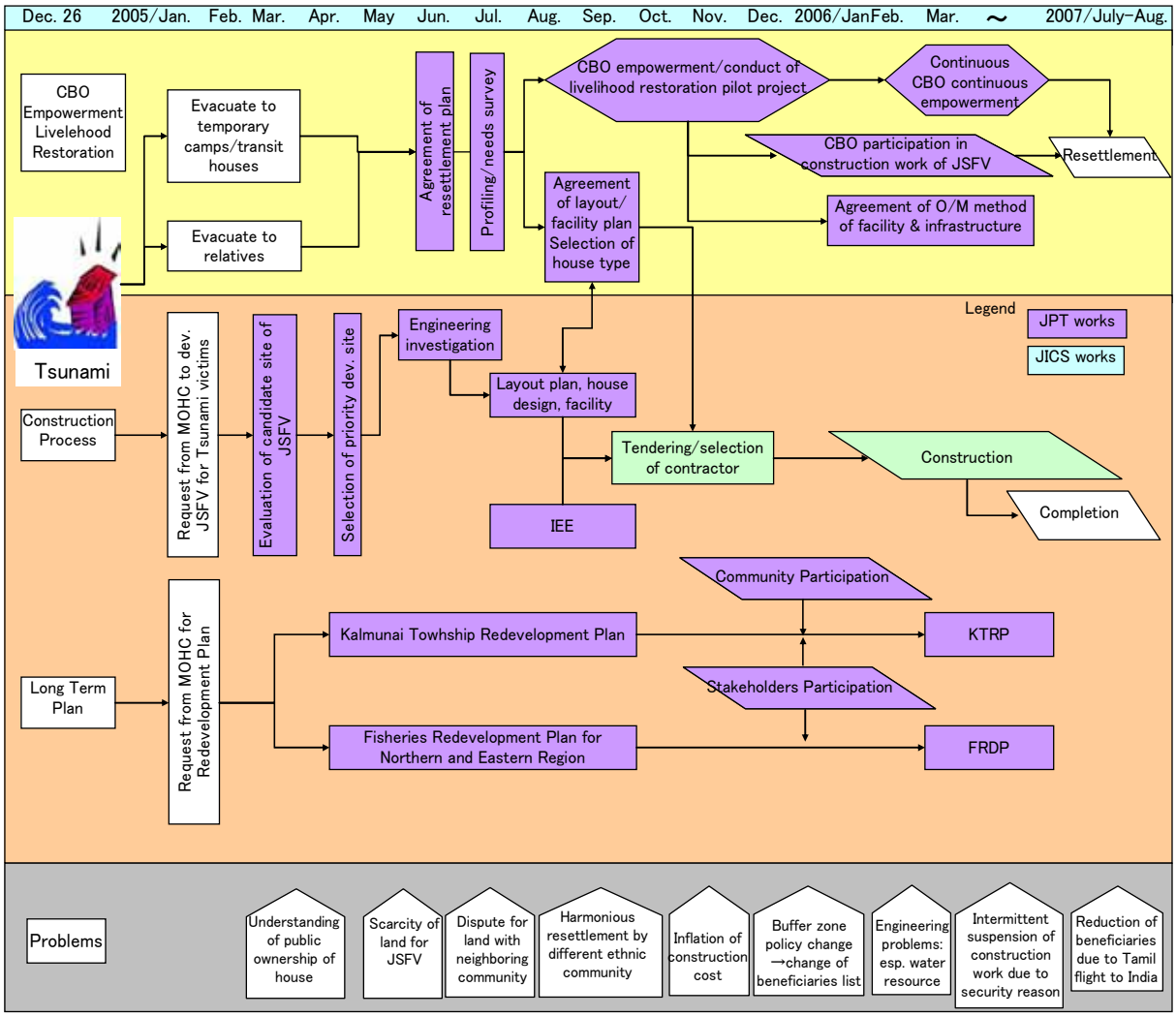
Source: JICA Project Team

CHAPTER 8 GUIDELINE FOR REHABILITATION/ RECONSTRUCTION AND RECOMMENDATION

8.1 Implementation Process of Rehabilitation/Reconstruction

As presented in the preceding chapters, the implementation of this project consists of two streams, namely, implementation of the urgent works represented by construction of JSFVs supported by strengthening of CBO, and long term plan formulation including township redevelopment and fisheries sector.

Figure 8.1.1 summarizes the implementation process of this project together with the major problems for construction of JSFV



Source: JICA Project Team

Figure 8.1.1 Implementation Process of Rehabilitation/Reconstruction

As the overall evaluation, urgent works of the rehabilitation have been successfully implemented though completion has been delayed, and long term development plans were well prepared through the participation of stakeholders and community people. Through implementation of this Project, it is proved that understanding of the stage of reconstruction (urgent relief, rehabilitation, reconstruction), and timely correspondence to the changing demands are the most important aspect for successful rehabilitation/reconstruction.

Results of the evaluation and lessons learned through the implementation of the project are presented below in more detail.

8.1.1 Urgent Works for Rehabilitation/Reconstruction

Construction of JSFV has been implemented successfully. Lessons learned through the implementation of the urgent works are:

(1) Difficulty in Construction of Private Housing

In this Project, construction of private housing is included in addition to the necessary infrastructure that requires various works such as needs assessment, ethnic and cultural considerations, and coordination among the government agencies and beneficiaries. It is to be understood that this preparatory work and arrangement take considerable time and even after completion, further assistance be required continuously.

(2) Frequent Change of Government Policy

Assistance policy to the victims including buffer zone changed frequently, that caused delay in implementation of the urgent works. In Hijra Nagar, confirmation of the beneficiaries list is delayed partly due to the change of the buffer zone. Basic policy for the rehabilitation/reconstruction is to be established at the early stage and any modification is to be publicized in an efficient manner.

(3) Lack of Coordination with Other Donors

A long time was required for land acquisition for the urgent works. This is partly due to lack of coordination for land arrangement among donors. Sharing common information among donors is particularly important in the initial stage for the rehabilitation, for that government agency is to take an initiative for integration of the related and efficient coordination.

(4) Unclear Counterpart Organization

The counterpart organization of this Project was originally the Ministry of Relief, Rehabilitation and Reconstruction (3R Ministry), that is changed, which later into the Ministry of Nation Building and Development. Counterpart personnel have not been provided by 3R, instead, practical support for implementing this Project has been given by the Ministry of Housing and Construction. The role of the counterpart personnel is critically important for implementing the urgent works that are to be clarified and assignment of necessary personnel is to be confirmed at the initial stage.

(5) Importance of Understanding Local Society

Understanding of local society is important for successful implementation of the urgent works. For harmonized development, settlement of land ownership dispute among ethnicities and development benefit sharing among the adjacent community are important. In this Project, land ownership dispute among Tamil and Moslems was settled by intervention of JPT and another technical assistance project called T-CUP commenced in parallel to this project, to promote livelihood improvement of the adjacent community.

(6) Unimproved Security Situation

As mentioned earlier, the difficult security situation is critical in the Northern and Eastern Region and has caused delay in the progress of the implementation of the urgent works. Sufficient allowance is to be taken into account for implementation scheduling.

8.1.2 CBO Formation and Capacity Development for Livelihood Improvement

In the JSFVs, CBOs were formulated and their capacity development has been facilitated through implementation of the pilot projects. However, it should be noted that considerable inputs to assist CBOs are prerequisite for enhancing their capacity. Solving the ethnic problems in CBO and problems caused by its frequent member change are the indication of successful achievement of the capacity development. Mainly due to the delay of JSFV construction, preparation of resettlement and O&M training for infrastructure and common facilities were delayed.

(1) Effective Implementation of CBO Strengthening in parallel to JSFV Construction

CBO strengthening through implementing pilot project contribute not only to improving the livelihood of the victims, but also to efficient implementation of JSFV. From the planning stage to design and construction stage, participation of CBOs was essential and facilitated the construction process even under the difficult security situation.

(2) Preparation for Resettlement

CBO empowerment is inevitable for the sustainable development of JSFV, particularly for O&M of the infrastructure and common facilities. Preparation for resettlement including setting-up of O&M organization and O&M training has been conducted in JSFV.

(3) CBO Strengthening with Different Origin (Hijra Nagar)

Beneficiaries of the Hijra Nagar came from different villages which makes it difficult for community integration as a whole. Many opportunities for employment in and around Pottuvil also cause slow progress of the integration. Continuous support for capacity development and substantial effort among the beneficiaries are required for enhancing integrity and improving the entire community livelihood.

(4) CBO Strengthening with Different Ethnicities (Iqbal Nagar)

In Iqbal Nagar, Tamil and Moslem live together with each occupying about a half of the JSFV housing (Even in Hijra Nagar, a small numbers of Tamil live together with majority Moslem). For attaining cohabitation among different ethnic groups, opportunity for sharing views is to be provided from early stages of planning. In our Project, workshop for integrating community was held in a place far from their origins that leads to mutual harmony for the new settlement. Such opportunities for discussing and sharing views are to be arranged as much as possible prior to the resettlement.

8.1.3 Plans Formulation (KTRP and FRDP)

Plans for redevelopment were prepared, both for Kalmunai Township Redevelopment (KTRP) and for Fisheries Redevelopment in the Northern and Eastern Region (FRDP). In particular, KTRP was formulated using a community participation concept, a part of which is under implementation by other donors.

(1) Guiding Plan for Kalmunai Township Redevelopment

The KTRP formulated through community participation is expected to play a role of guiding plan for development by other donors. The fact of the actual implementation of the proposed schemes would prove this. The process for preparation of the long term plan also contributes to further understanding on the importance of co-assistance during rehabilitation and reconstruction.

(2) External Effects of Pilot Project (Activating Local Industry)

The pilot project for activating local industry implemented in Kalmunai shows a good example of participatory livelihood improvement of the community. An exhibition of the products prepared in the pilot project held at the Katunayake international airport facilitated the improvement of quality and marketing of the products. Moreover, the producer group has been active in participating in the exhibition held in Colombo by the National Handicraft Council. Through these, the pilot project proves the effectiveness of activating local industry and facilitating reconstruction.

8.2 Validation of Planning Hypothesis

The hypothesis set for the implementation of this Project is summarized below:

- For the efficient recovery and rehabilitation from serious disasters like tsunami, integrated efforts of private, community and government (namely, self-reliance, co-assistance and public support) are indispensable. Among the three, co-assistance of the community people plays the most important role and empowerment of the community is much needed for the successful operation.

- The concepts of “transitional township” applied for the reconstruction of housing in this project are proximity of transitional township from the original residence, community participation in planning and construction, and integrated development of resettlement houses with infrastructure and common facilities, that are effective and facilitate rehabilitation and reconstruction.

- The multiple approach including housing reconstruction, urban living environment restoration and local industry redevelopment is the most effective one for rehabilitation/reconstruction

After implementation of this project, verification of the effectiveness of the hypothesis mentioned above are made as summarized below.

1) Community empowerment was facilitated through CBOs participation in the implementation of JSFV from the stage of planning, design and construction. Implementation of a livelihood programme through the pilot project also promoted community empowerment as well as preparation of KTRP applying the community participatory approach. It is verified that co-assistance has been enhanced through this community empowerment and worked effectively for early realization of rehabilitation and reconstruction.

2) Experience of JSFV proved that necessity of infrastructure and community facilities in addition to permanent housing is quite high and effective for early realization of community life, and eventually for materialization of rehabilitation. The community activity will be better activated using these facilities through that recovery to the normal life will be facilitated.

3) Though reactivation of local industry is implemented in small scale using the pilot project, the multiple approaches have been applied in this project. It is verified that multiple approach including rehabilitation of permanent housing, infrastructure and local industrial activity produces synergy effects among them and is quite effective for early rehabilitation and reconstruction.

Further details of this verification are presented in the following table.

Table 8.2.1 Validations of the Project Hypothesis

Hypothesis / Item		Necessity of Community Empowerment	Transitional Township Concept	Multiple Approach
(1) Implementation of Rehabilitation /Reconstruction	1) Development of resettlement house (JSFV)	• Although co-assistance among community members exists, strengthening of community co-assistance in the field of ethnic harmonization, mixed resettlement with different communities, and harmonization with adjoining communities was effective for development of JSFV. • Community co-assistance among different ethnic groups was effective for the development of mixed settlement. • However, unstable security condition caused by ethnic conflict easily undermines community co-assistance. Peace keeping should be precondition of the community restoration project.	• Planning of resettlement houses was done smoothly by the beneficiaries' participation. • JSFV construction works were progressed by beneficiaries' participation into the woks as the skilled and unskilled labors even under the critical security conditions. • IN-JSFV, HN-JSFV and Konesapury site that installed infrastructure and facility were highly welcomed by beneficiaries. • However, proximity from the original residence could not be fully considered for HN-JSFV and Konesapury due to the scarceness of suitable land for resettlement housing site.	Permanent housing is constructed for the beneficiaries.
	2) Livelihood restoration	• Livelihood improvement is required particularly for poor people with limited capacity of self reliance. • Income generation activity achieved by skill training led to community empowerment. • Livelihood restoration by the restart of agricultural and fishery activities was successfully achieved as well as community empowerment by the pilot project.		Implementation of the pilot project contributed to livelihood improvement of the beneficiaries.

Hypothesis / Item	Necessity of Community Empowerment	Transitional Township Concept	Multiple Approach
(2) Plan Formulation (KTRP and FRDP)	• Kalmunai township redevelopment plan was formulated by participation of local community, local businessperson, academia and local government officer. The plan has been referred by donors and INGO as a principle city development plan when new redevelopments are proposed. • Participation of the affected local community is effective to integrate the realistic redevelopment plan. • Capacity building of community and local government and communication reinforcement between local government and central government were effective for plan making and implementing promotion.		• Restoration and promotion of local industry were proposed by KTRP and FRDP for the livelihood improvement that was implemented by a pilot project. • Activation of local cottage industry utilizing unused local resources was implemented. Handicraft exhibition was held at the Katunayake airport and several exhibition markets to show the results that contributable to improved distribution and marketing. • Urban living environment is planned to be improved through Thonas restoration and flood control.

8.3 Recommendation

8.3.1 Conclusion

As presented in the preceding chapters, it is concluded that this Project comprising implementation of urgent works supported by CBO formation and its capacity building, and long term redevelopment plans has been carried out successfully for the rehabilitation and redevelopment of the affected Northern and Eastern Region. Importance of the co-assistance through community empowerment for the rehabilitation/reconstruction is proved in this Project. The formulated two redevelopment plans, KTRP and FRDP indicate future direction of the development and proposed priority projects for early realization of the reconstruction. From the above, it is concluded that the results of this Project are to be used as a model for rehabilitation and reconstruction after gigantic disasters like the tsunami.

8.3.2 Recommendations

For effective implementation of the rehabilitation and reconstruction works and for future development the following recommendations are provided.

(1) For Rehabilitation/Reconstruction in Poverty Region

The following recommendations are made for successful implementation of rehabilitation and reconstruction in the poverty area like Northern and Eastern Region on the basis of the experience of JSFV development and KTRP.

1) Necessity to support livelihood of the victims in parallel to rehabilitation of housing

Through the implementation of JSFV and preparation of KTRP, the needs of the victims for the livelihood improvement are well understood. As indicated in the preceding chapter, economic situation of the people living in the Northern and Eastern Region is considerably lower than the national average. High demand for recovery and improvement of the livelihood was identified in the initial profile survey, for that various pilot projects for livelihood improvement were implemented. In Kalmunai municipality, pilot project for activating local industry has been implemented. Preliminary results of the pilot project has been presented with high reputation in the Exhibition at the International Airport , that contributes to activating local industry by utilizing un-used local materials and to enhancing prospects for livelihood improvement in the area. As proved during implementation of the Project, support for livelihood of the victims is the most important for the recovery and rehabilitation from the disaster damage, particularly in the poverty area.

2) Necessity to take "harmony" within victims and with adjacent areas fully into account

Various activities are carried out for keeping harmony among different ethnic groups in this Project, such as cooperation of Tamil and Moslem in JSFV, and collaboration for planning of KTRP. Typical example of the harmony in different ethnicity is the case of Iqbal Nagar where workshop and various meeting were held to reach consensus.

To keep harmony with adjacent poverty areas is also important cooperation that is proved particularly in solving land problems for JSFV. Development effect on the livelihood improvement is also to be reflected to the adjacent areas as well as installation of infrastructure. Keeping this kind of harmony is considered one of the most important factors for the successful implementation of the rehabilitation and reconstruction works.

3) Necessity to support and strengthen institution and organizations

Local government system and CBO are relatively well established in Sri Lanka. However, the local budget is small and the capacity is quite limited in the poverty area. As implemented in the Project, strengthening of CBO is much needed; CBO for resettlement is to be formulated and then, registered, necessary training on CBO to be implemented including preparation of O&M after resettlement. Capacity development of local government is also necessary for positive participation in planning and implementation of rehabilitation, coordination with the central government agencies, and support for CBO. In this Project, capacity development for Kalmunai municipality has been conducted through the formulation of KTRP and implementation of the pilot project for activating local industry.

(2) For Follow up of Resettlement and O&M

Construction of JSFVs was completed in August 2007 and most of the beneficiaries except for the Tamil families evacuated to India have resettled in JSFV. Preparation of the resettlement of the beneficiaries including training of O&M for infrastructure and common facilities were carried out.

1) To strengthen CBO for sustainable resettlement

For the preparation of the resettlement, further training of the CBOs including training for O&M of infrastructures (particularly for water supply) and community facilities was implemented by the appropriate authorities assisted by NGOs. It is recommended that JICA will follow up with its technical support to make the project sustainable and to improve the livelihood of the beneficiaries.

2) To coordinate with T-CUP and TRINCAP

In parallel with this Project, other JICA technical assistance projects called T-CUP and TRINCAP started from 2006. T-CUP is designed to support livelihood of poor villages around JSFVs as well as monitor and follow up the operation and management of JSFVs after settlement, while TRINCAP supports farmers around Iqbal Nagar. It is recommended that the coordination with these JICA technical assistance projects, especially with T-CUP is to be strengthened for the sustainable operation of the JSFV. Since the target population of T-CUP includes the beneficiaries of the two JSFVs, close follow-up supports of the operation and management of JSFVs and effective monitoring using the PNA results are highly expected.

(3) For Follow up of Plans

For the early realization of the proposed priority project, particularly for the Kalmunai Township Redevelopment Plan, it is recommended that the government is to give them higher priority and request international fund sources including JBIC or Japanese grant aid. Early materialization of the priority projects could facilitate community participation for the redevelopment of the township.

A pilot project to activate the local cottage industry in Kalmunai verified the viability and effectiveness of such scheme. Lessons of the pilot project can be replicated to activate the cottage industry in the tsunami-damaged area and undeveloped poor area throughout the island. JICA technical programme is one of the aid resources for this replication.

(4) For Efficient JICA Study and Non-project Grant Aid

Through the implementation of this Project, the following recommendations are made for efficient implementation of the JICA urgent development study and Non-project grant aid.

1) To introduce more flexible implementation system for urgent study

Modification of the scope of work required contract revision several times for implementing this Project and relaxation of rules and regulations were made during the implementation. In due consideration of the urgent situation where needs of the victims changed frequently corresponding to the progress of the recovery and special situation of the local security, more flexible application of the regulations is recommended for implementing urgent works.

2) To introduce more efficient coordination system between Non-project grant and urgent study

Non-project grant aid for rehabilitation/redevelopment of damaged infrastructure and facilities and the urgent development study for technical assistance are both indispensable for the successful redevelopment of the damaged area. Promotions of beneficiaries' participation by community empowerment, settlement of land dispute and ethnic harmony, etc. achieved by the urgent study are necessary for the success of the rehabilitation/redevelopment aid.

Prior to implementing the urgent development study, contents of the Non-project grant aid were almost determined. However, local needs frequently changed as the rehabilitation progressed. It is, therefore, recommended that results of the development study are to be fully taken into account and reflect any modification of the scheme of Non-project grant aid as much as possible.

APPENDICES

Appendix 1 List of Project Members

I. Government of Sri Lanka

JSFV		
Organization	Name	Position
Ministry of Nation Building and Development (3R)	Mr. M.S.Jayasinghe Mr. M.I.S.Ahamed	Secretary Additional Secretary
Ministry of Urban Development and Water Supply	Mr. A.N.R.Amaratunga Mr. Thosapala Hewage Mr. M.I. Abdul Lathiff	Secretary Former Secretary Director (Water Sector)
Urban Development Authority (UDA)	Mr. Prasanna Silva Mr. K.A.D.Chandradasa Mr. S.P.Karunadasa	Additional Director General Acting Director Eastern Province Deputy Director
Ministry of Housing and Construction	Mrs. S.M.Karunarathne Mr. P.Weerahandi Mr. U.N.Rodrigo Mr. U.W.Rodrigo Mr. P.W.Kodippili Mr. S.W.A.Jayathilaka Mrs. S.Gunathilaka Miss.Dammika Wijesingha Mr.S.R.Kanaganayagam Mr.Christopher Wijeyaweera	Secretary Former Secretary Additional Secretary (Housing) Additional Secretary (Technical) Additional Secretary (Administration) Director (Special Projects) Director (Planning) Deputy Director (Planning) Consultant Director
National Housing Development Authority (NHDA)	Mr. M.I.M.Rafeek Mr. W.Wijerathne Mr. G.A.Piyal Hemantha Ganepola Mr. Nawaratne Trikumar Mr. M.Sivapalasundaram Mr. S.D.Danapala Mr. Ranjan Jayawardena	Chairman General Manager Former General Manager Director (Trincomalee) Former General Manager Project Coordinating Engineer Engineer
Ministry of Fisheries and Aquatic Resources	Mr. G.Piyasena Mr. Santha Bandara Mr. J.A.D.B. Jayasooriya Mr. Anil Premaratne Mr. Domingo George Mr. Thoufeek Mr. Fareeth Mr. Selvarajah Mr. Tharmalingam	Secretary Assistant Director Head of Statistics Unit Planning Deputy Director Assistant Director (Ampara) Former Assistant Director (Trincomalee) Former Assistant Director (Trincomalee) Assistant Director (Batticaloa) Assistant Director (Jaffna)
National Aquatic Resources Research and Development Agency(NARA)	Dr. Kapila Perera Dr. Ranjith Edirisinghe Dr. Champa Amarasiri	Chairman of NARA Head of Post-harvest Tech. Division Head of Marine Biological Resources

National Institute of Fisheries and Nautical Engineering (NIFNE)	Dr. Rahula A. Attalage Capt. Jayasinghe	Chairman Director
Ministry of Disaster Management and Human Rights	Mr. Peter Dias Amarasinghe Mr. A.H.Gamini Hewage	Secretary Actg Deputy Director(Planing)
Reconstruction And Development Agency (RADA) (TAFREN/THRU)	Mr. Tiran Alles Mr. Ramesh N.Selliah Mr. Indhara K.Rajapaksa Dr. M.M.Hanifa Mr. Harsha De Silva	Chairman Director, Housing Director, Livelihood Livelihood Economic Recovery Officer Former Chairman (THRU)
National Water Supply and Drainage Board	Mr. M. Wickramage Mr. G.A. Kumararathna Mr. Ranjith Warusamana Mrs. M.K. Bandara Mr. K.R. Dewasurendra Mr. M.K. Hapuarachchi Mr. Chrishan Fernando Mr. R.S.C. George Mr. P.P.Kahaduwa Mr. Yatila De Silva Mr. Dhanesh Gunatilleke Ms. P.D.S.M.Sriyani Mr. K.Vassudevan Mr. S.R. Ranasinghe	General Manager Deputy General Manager (Planning and Designs) Assistant General Manager (Planning and Designs) Assistant General Manager (Planning and Designs) Deputy General Manager (Foreign Funded Project) Assistant General Manger (Foreign Funded Project) Assistant General Manager (Groundwater) Deputy General Manager (Corporate Planning Assistant General Manager East Chief Engineer Chief Engineer(Planning &Designs) Chief Engineer(Planning &Designs) Chief Engineer (Planning & Coordination, Trincomalee) Chief Engineer (Ampara)
Sri Lanka Land Reclamation & Development Corporation	Mr. P.P.Ghnanapala	Deputy General Manager(Research & Designs)
Water Resources Board	Mr. R.N. Karunaratne Mr. H.M.U.Bandara Mr. Upali Jayaweera	General Manager Assistant General Manager(Drilling) Provincial Manager (U/E)
Road Development Authority	Mr. R.M.Amarasekara	Director Planning
Eastern University	Dr. S.M.M.Ismail	Head of Department of Social Science
Ampara District Officer	Mr. Sunil Kannangara Mr. Herath Abeyweera	Government of Agent Former Government of Agent

	Mr. U.L.A.Azeez Mr. M.M.Nawfer Mr. A.L.M Azmi Mr. A.A.Maulana Mr. M.Y.Saleem	Additional Government Agent Divisional Secretary（Pottuvil） Additional Divisional Secretary(Pottuvil) Municipal Councilor (Kalmunai) Municipal Commissioner(Kalmunai)
Trincomalee District Officer	Mr. T.T.Ranjith Silva Mr. K.G.Leenalananda Mr. W.A.S.B. Amarathunga Mr. N. Selvanayagam Mr. S.Jaladeepan Mr. Aruganayagam	Government of Agent Former Government of Agent Additional Government of Agent Divisional Secretary (Kuchcheveli) Divisional Secretary Town & Gravel Former Divisional Secretary Town & Gravel

Ⅱ.Embassy of Japan /JICA/JICS

Embassy of Japan /JICA/JICS		
	Name	Position
Embassy of Japan	Mr. Akio Suda	Former Ambassador
	Mr. Hiroshi Karube	Former Minister
	Mr. Hideyuki Onishi	Counselor, of Head of Economic Cooperation Section
	Mr. Yuji Miyahara	First Secretary Economic Cooperation Section
	Mr. Yasuhiro Watanabe	Second Secretary Economic Cooperation Section
Japan International Cooperation Agency (JICA)	**Headquarters**	
	Mr. Masami Fuwa	Senior Assistant to the Director General, Social Development Department
	Mr.Yoshiro Kurasashina	Team Director, Transportation Team I, GroupⅢ Social Development Department
	Mr. Masatoyo Ishihara	Program Officer, Transportation Team I, GroupⅢ Social Development Department
	Mr. Hiroyuki Tanaka	Country Officer, South Asia Team, Regional Department Ⅱ
	Mr. Hirotsugu Mori	Program Officer, Transportation Team I, GroupⅢ Social Development Department
	Mr. Hideaki Matsumoto	Program Officer, Water Resources and Disaster Management Team Ⅱ , Group Ⅲ Global Environment Department
	Ms. Yasuko Shimizu	Senior Advisor on JICA-UNHCR partnership Planning and Coordination Department/ Social Development Department
	Mr. Mikio Ishiwatari	Advisor, Institute for International Cooperation Senior Advisor (Disaster Management and Water resources Management)
	Sri Lanka Office	
	Mr. Takumi Ueshima	Resident Representative
	Mr. Hideya Kobayashi	Former Assistant Resident Representative
	Ms. Kotohi Inoue	Assistant Resident Representative
	Ms. Isa Imazato	Project Forumlation Advisor
Japan International Cooperation System (JICS)	Mr. Takayuki Jimbo	Former Project Director
	Mr. Keizo Inoue	Project Manager
	Mr. Takashi Ota	Resident Engineer

Ⅲ. JICA Project Team

Name	Position
Mr. Toshikazu Tai	Team Leader
Mr. Isamu Asakura	Deputy Team Leader/Planning of Under Rehabilitation
Mr. Jun Kuwabara	Planning of Land Use and Residential Development
Mr. Keisuke Okazaki	Water Supply Planning
Mr. Shigeo Kanai	Night Soil Treatment, Sewerage
Mr. Satoshi Higashinakagawa	Solid Waste Management
Ms. Sayuri Teramatsu	Solid Waste Management/Environmental Impact Assessment
Mr. Hirohito Seto	Planning and Design of Public Facilities
Mr. Masato Kuroda	Architect/Public Facility Planner
Mr. Hiroshi Abe	Disastrous Water Management
Ms. Akiko Okitsu	Public Health/Living Environment Planning
Mr. Takashi Sugiyama	Rehabilitation/ Redevelopment Program
Dr. Guy Motha	Institutional Analysis
Mr. Toru Ishibashi	Social Studies and Community Development
Ms. Tomoko Otsuki	Community Participation/Resettlement
Mr. Mitsuru Nanakubo	Agricultural Recovery Support
Mr. Masafumi Ikeno	Community reinforcement/community Disaster Prevention
Mr. Soichiro Nakata	Road Planning
Mr. Teruo Matsuda	Planning and Management of Land Development(KNO)
Mr. Shinya Osumi	Planning and Management of Land Development
Mr. Hidekazu Konishi	Tender Documents/Cost Estimator
Mr. Shigeru Kobayashi	Fishery Development
Mr. Kozo Kondo	Fishery Facility Planning
Mr. Tan Eng Guan	Fishery Facilities Development
Dr. Ibrahim Allahpichay	Fish Marketing Distribution
Ms. Yuki Niimura	Supervision of Fisheries Pilot Project
Mr. Kazuharu Hashimoto	Flood and Drainage Planning
Mr. Koji Shimizu	Flood and Drainage Planning
Mr. Simon Penny	Environmental Sanitation
Ms. Tomoko Tamura	Community Participation/Resettlement
Ms. Megumi Takahashi	Project Coordinator/Pilot Project Monitoring

Appendix 2: Project Chronology (Japan Sri Lanka Friendship Village)

Year	Month	Sri Lanka Situation related to North and East Conflict	Progress of the Project	Problems and Disturbance
2004	Dec 26	(Tsunami hit Sri Lankan Coastal Area)		
2005	January		・Non Project Grant Aid with 80 Billion Yen was expressed by the Japanese Government. (1st) ・Preliminary damage and needs assessment was prepared by joint mission with ADB, JBIC, JICA and WB.(until 28th)	
	February	・LTTE executive was assassinated by Karuna faction. (7th)	・Ministry of Housing Submitted proposal for Permanent Housing proposal to ERD. (1,000House holds with 5 sites, USD 6.43 mil)	
	March		・JICA Dispatched RRDP-NE Project Team. (13th)	
	April		・Initial Assessment for the Candidate Site(Ampara, Batticaloa, Trincomalee, Mullative)was conducted. Iqbal Nagar in Trincomalee and Alayadivembu in Ampara were selected as priority. ・Second phase of needs assessment was done. ・JICA explained to Sri Lankan government that Japanese government couldn't approve to transfer property to individuals.(11th) ・JICA Project team discussed with CEA about environmental procedure that ・Environmental approval shall be applied for Tsunami housing project. (IEE basis) ・JICA had discussion with secretary of Ministry of Housing and TAFREN issues on transfer of housing right. (29th)	
	May	・An officer of Army Intelligence Unit was shot dead. (31st)	・Sri Lankan Government agreed Japanese policy on non-transferable property right to individuals for housing project. (3rd) ・Pottuvil site was recommended from UDA Ampara due to high construction cost of Alayadivembu. (10th) ・JICA Project team discussed JSFV Scheme at LTTE controlled area, they insisted that P-TOMS agreement is a pre-condition of the project. (11th) ・Sri Lankan Government and JICA agreed the allocated site in Hjira Nagar and Iqbal Nagar. (31st)	
	June	・P-TOMS was agreed between the Government and LTTE. (24th)	・Conceptual layout plan was explained and discussed with two communities for Iqbal Nagar. (23rd and 24th). ・MOU was signed with Sri Lankan Government and Japanese Government.(24th) ・Government of Sri Lanka proposed JICA to implement Konesapury housing project. ・Land Clearing for perimeter and contour survey started at Hjira Nagar.	
	July	・Two LTTE executives are killed in Trincomalee. (10th) ・Fighting on LTTE and Navy in Trincomalee. (14th) ・P-TOMS was rejected by Supreme Court.	・Conceptual layout plan was explained and discusses with beneficiaries of Hjira Nagar communities. (1st) ・A Member of Parliament in Trincomalee assisted for reaching an agreement on local problem in Iqbal Nagar among stakeholders, Site moved to 100 m to north. ・Construction site for fisherman's warehouse for beneficiaries in Hjira Nagar agreed. (14th) ・Draft of beneficiaries list was submitted. Project team started profile survey for all the site.(finished on 15th) ・Japanese Embassy made decision for supporting infrastructure development for Konesapury. (28th)	・Land acquisition problem occurred in Iqbal Nagar Site (1st) ・Muslim community expressed objection for joint settlement with Tamil community in Iqbal Nagar. (15th) ・Neighboring Tamil community requested to include Tamil families in Hjira Nagar. Arrangement was made until end of the month.
	August	・Foreign Minister Kadirgamar Lakshman was assassinated in Colombo. (13th) ・Supreme Court advised to conduct president election within this year. (20th) ・Meeting for ceasefire agreement was not held.	・Distribution of plot between Tamil and Muslim community was agreed for Hjira Nagar site.(1st) , Accordingly, site shape and plan were revised. ・Social Harmony Workshop was held at Kandy among Tamil and Muslim communities for Iqbal Nagar (3rd 4th). ・Development Permission was issued for Layout plan of Iqbal Nagar (4th) and Hjira Nagar (31st) from UDA. ・MOU was signed for housing construction among related NGOs for Konesapury Site in Trincomalee. (22nd) ・Approval of tender documents were given for Iqbal Nagar sites by Ministry of Housing. ・Environmental clearance was formally issued for Iqbal Nagar site. (24th) ・First tender for Iqbal Nagar was informed (24th) ・Community workshop was held for Hjira Nagar (27-28th) ・JICA Project Team started livelihood restoration program(end of the month)	
	September	・Proposal for CFA meeting was rejected. ・EU announced to reject the LTTE representatives entering its area and listing LTTE on its list of terrorists. (26th)	・Environmental clearance was formally issued for Hjira Nagar site (1st) ・Approval of tender documents were given for Hjira Nagar sites by Ministry of Housing ・First tendering for Hjira Nagar was informed (20th) ・Environmental clearance was formally issued for Konesapury site 22nd ・Progress Report (1) was submitted by JPT.	
	October		・2nd Tendering for Iqbal Nagar, (4th)	

Year	Month	Sri Lanka Situation related to North and East Conflict	Progress of the Project	Problems and Disturbance
			・1st Beneficiaries list from Hjira Nagar was confirmed (3rd) ・Eastern University decided not to release land for access road from JSFV at Iqbal Nagar (5th) ・Revision of the buffer zone was published by the Sri Lankan Government(14th) ・Development permission was issued for layout plan of Konesapury from UDA(20th) ・2nd Tendering for Hjira Nagar, (31st) ・CBO made agreement among stakeholders to settle Hjira Nagar ・CBO made agreement among stakeholders to settle Iqbal Nagar	
	November	・Election for a President. (17th) ・A Muslim senator assassinated in Batticaloa. Muslim community in eastern area became unstable. (end of Nov)	・Tendering for Konesapury (18th)	・KPMG started construction of housing without any agreement with JPT and other NGOs (Last week in November) .
	December	・Tension was raised between Tamil and Muslims after the election. ・LTTE started continuous attack to Government troops. ・33 person was killed by LTTE Attack within this month. ・Tension increased in Jaffna.	・THRU decided to exclude KPMG for Konesapury Site (14th) ・Contract Awarding for Hjira Nagar, Konesapury and Iqbal Nagar 14th ・Sri Lankan Government revised regulation on buffer zone on coastal area. Candidates of all JSFV beneficiaries forced to be changed (26th). ・Progress Report (2) was submitted by JPT.	
2006	January,		・Construction works started at all site. (1st)	・Hjira Nagar site was closed due to security condition from 22nd -27th ・Iqbal Nagar site was closed from 1st – 18th. ・Konesapury site was closed from 1st – 25th.
	February	・Meeting between LTTE and the government was held in Geneva.	・Project team started water resource exploring in Konesapury, Iqbal Nagar and Hjira Nagar site. ・JICA Project Team explained land use planning to Housing Minister(3rd) ・Beneficiary list for Iqbal Nagar and Hjira Nagar were submitted.・RDS in Hjira Nagar rejected to be hired as laborer for construction.	
	March	・Election on local administration was conducted. (30th)	・Exploration of water resource for the 1st batch was not succeeded at Hjira Nagar and Iqbal Nagar. ・Interim Report was submitted by JPT. ・Request for water resource for Irrigation Dept. for Hjira Nagar was made by JPT	
	April	・Meeting in Geneva was postponed until situation stabilization. (21st) ・The army commander was injured by suicide attack by LTTE. (24th) ・Air Force started air strike on LTTE base in Trincomalee. ・A9 Road for Jaffna was closed. (26th) ・Fighting in North and Eastern Region started.		・Tamil Beneficiaries in Iqbal Nagar started to evacuate to India. ・Iqbal Nagar site was closed from 9th – 30th. ・Konesapury site was closed from 9th – 30th . ・Hjira Nagar site was closed due to security condition from 10th -28th.
	May	・The Air Force Stroke on Killinochi. (11th) ・SLMM suspended activities on sea. (12th) ・An INGO office in Muthur DS was attacked by hand grenade and two killed. (21st) ・EU banned remittance for LTTE. (29th)	・Irrigation Dept proposed dug well development along downstream of the adjoining Rottai tank at Hjira Nagar site.	・Iqbal Nagar site was closed from 1st – 10th. ・Konesapury site was closed from 1st – 8th. ・Hjira Nagar site was closed due to security condition from 10th -28th.
	June	・LTTE refused to attend meeting on Monitoring Mission. (12th) ・Bus was attacked by Claymore, 60 persons killed and 80 wounded near Vavunia. (15th) ・Army Executive was assassinated by suicide attack. (26th) ・LTTE Camp was attacked in Telekovil.		
	July	・Fighting on Mavilaru Area started. (29th)	・Beneficiary meeting for consensus building was conducted for Hjira Nagar. (31st to 3rd Aug)	
	August	・Bomb blasted near Kandy. (7th) ・Bomb blasted in Colombo. (8th) ・15 NGO Staff was killed in Trincomalee.	・Leadership Training for Hjira Nagar RDS was conducted. ・Household Survey was conducted for Hjira Nagar beneficiaries.	・Two beneficiaries of Iqbal Nagar was killed by shooting. (3rd)
	September	・11 staff for irrigation work is killed by armed group in Pottuvil, (17th) ・Election in east region were postponed by 2007	・Water source of Hijra Nagar was finally decided through several well drillings and coordination with USAID and NWSDB.	・Hjira Nagar site was closed due to security condition from 17th -30th.
	October	・102 Navy solders were killed by suicide attack in Habarana. (16th) ・German Government stopped development assistance for new programs. (17th) ・The supreme court issued the judgment on tentative merger of the ・Northern and Eastern Provinces unconstitutional. (17th) ・LTTE attacked Galle Port by suicide attack. (18th) ・The direct discussion between GoSL and LTTE took place in Geneva. (28,	・Workshop on O&M Hjira Nagar RDS with Government officials are conducted. (4th) ・NWSDB gave permission on design of water distribution. ・Number of housing decreased due to evacuation of the families at Konesapury. (Layout plan changed)	・Iqbal Nagar site was closed from 18th – 25th. ・Konesapury site was closed from 18th – 25th.

Year	Month	Sri Lanka Situation related to North and East Conflict	Progress of the Project	Problems and Disturbance
		29)		
	November	・LTTE leader at his speech asserted that the ceasefire agreement has disappeared. (27th)	・Revised beneficiaries list was submitted from Pottuvil DS. (6th) ・Konesapury site was operated with limited workers.	・Iqbal Nagar site was closed from 20th – 30th. ・Hjira Nagar site was closed due to security condition from 20th -30th.
	December	・Bomb blasted at Colombo. (1st)	・Iqbal Nagar site was re-started, but operated by only limited workers. ・Konesapury site was re-started, but operated by only limited workers. ・Revised Beneficiary list for Hjira Nagar was submitted. (27th)	・Armed Group appeared Hjira Nagar site and robbed three tractors. Workers evacuated until 3rd January 2007. (3rd) STF and Police agreed to conduct surveillance. (27th)
2007	January	・Conflicts between Government troops and LTTE occurred so often in Ampara Area. ・Bomb blasted at Colombo. (5th) ・Bomb blasted at Colombo. (6th) ・Sri Lankan Troops occupied Vakarai in Batticaloa District, LTTE retreated from eastern region. (22nd)	・Construction work of Iqbal Nagar and Hjira Nagar re-started. (3rd) ・Exhibition of handicrafts was held at the international airport. (31st)	
	February	・LTTE fired on helicopter in Batticaloa in which foreign diplomats are on board. (27th)	・Hijra Nagar: progress review meeting was held. (6th) ・Hijra Nagar: beneficiaries list for Hjira Nagar was publicized. ・Draft Final Report was submitted by JPT.	
	March	・LTTE light airplane attacked the air force base adjacent to Colombo international airport (26th)	・Iqbal Nagar: progress review meeting was held. (29th)	
	April	・Bomb installed in a bus blasted at the army checkpoint near Ampara. Kileld 16. (2nd) ・Bomb blasted the bus at the roadside near Vavunia. Killed 7. (7th) ・LTTE airplane attacked the airforce base near Jaffna. (24th) ・LTTE airplane attacked the oil refinery plant and gas tank near Colombo. (29th)	・JICA HQ decided to extend the Project in light of the delay of the construction of JSFVs.	NWSDB Ampara expressed their difficulty to undertake drinking water supply for Hijra Nagar.
	May	・A bomb set on a motorcycle blasted in the center of Colombo city. (24th) ・A bomb aiming at STF blasted in south Colombo. Killed 7. (29th)	・ Hijra Nagar: beneficiaries' list was publicly opened at DS office. (2nd) ・ Progress review meeting was held in HN (14th) and IN (17th).	PS of Pottuvil and KUchchaveli insisted that JSFV should get their approval on building plans.
	June	・Two SLRC staffs abducted in Colombo was found dead in Ratnapura. (2nd) ・Police forcibly transferred 370 Tamil residents in Colombo to northeast areas. (7th)	・Iqbal Nagar: beneficiaries' meeting was held to discuss on O&M roles and responsibilities, housing ownership, etc. (9th) ・Hijra Nagar: awareness workshop for water supply system was held. (11th) ・Hijra Nagar: Technical Training on Community Water Supply Scheme. (18-20th)	・Many complains and were made with regard to the beneficiaries list of Hijra Nagar. ・Procedure of vesting land was not started.
	July	・Army force brought the last LTTE stronghold in eastern area (Toppigala, Battikaloa) under control. (11th) ・The chief secretary of the Eastern Provincil Council was shot dead in his office. (16th)	・ Hijra Nagr: beneficiaries' meeting was held. (7th) ・ Iqbal Nagar: progress review meeting was held. (17th) ・ Konesapry: MoH conducted the coordination meeting on O&M of common facilities and resettlement procedures with related donors. (18th) ・ Questionnaire survey for skills development training was conducted in both IN and HN. ・ Hijra Nagar: beneficiaries' list was revised.	・Slow progress of water supply connections in Iqbal Nagar. ・The contractor for Hijra Nagar found that design for water supply facility should be changed and the construction would take longer than expected. ・Slow progress of NHDA to prepare settlement permit.
	August	・A staff of Danish NGO for demining was shot dead in Jaffna. (20th)	・ Iqbal Nagar: handover of the housing began. (1st) ・ Iqbal Nagar: O&M workshop was held. (1st) ・ Handicraft producer group of Kalmunai joined the handicraft exhibition held in Colombo. (18-21st) ・ Iqbal Nagar: Household survey started.	・33 beneficiaries households in Hijra Nagar were reported as ineligible by Pottuvil police station. ・A beneficiary of Hijra Nagar shot dead near JSFV site.
	September	・Army force brought southern Manner LTTE stronghold under control. (2nd)	・ Hijra Nagar: handing over of housing began. (4th) ・ Drafted the Project Level Peacebuiding Needs and Impact Asessment (PNA).	Delay of electricity supply for both IN and HN.
	October	・UNHCR mission visited Jaffna to assess human right issues. ・Navy force sink a LTTE boat in southern offshore sea considered as carrying heavy arms. (7th) ・LTTE attacked the army base in Yala National Park. (15th) ・LTTE attacked the air force base in Anuradapura from land and sky. (22nd) ・Six LTTE executives including a political leader Tamilchalvin was killed by bombardment by air force. (Nov. 2nd)	・ Conducted the research for project level PNA. ・ Hijra Nagar: GA Ampara announced his decision on remaining 33 HHs. (5th) ・ Hijra Nagar: household survey started. ・ MOU for O&M between MoH, RDS and related parties signed for IN and HN. ・ Draft Final Report (2) was submitted by JPT.	House connection of water and electricity supply in Konesapry is stagnant due to the absence of beneficiaries list.

Appendix 3 Living Environment of Beneficiaries

1. Iqbal Nagar

As of June 2006, 64 households or one forth of the total numbers of beneficiary households left camps and moved to relative's houses nearby, as the living condition of the temporary huts in the camps was very poor. Number of families who left camps was increased as time goes on. The beneficiaries who do not have any other places kept on staying in the camps.

After deterioration of the security situation in April 2006, number of Tamil families left for India and other places in Sri Lanka as refugees. The situation became worse after the beginning of the fighting between the Sri Lankan government security forces and the LTTE at the end of August 2006 in Sampur, which is around 10 kilometers from Trincomalee town. The beneficiaries were frightened, as killings and murders happened frequently in the surrounding villages. The sounds of shooting and bombings were also one of the causes of mental stress to the beneficiaries. It was a sad incident that two of the beneficiaries were killed at the army check-point in Trincomalee on 10th August, 2006.

As at September 2006, 57 Tamil families moved to in India, out of the total 246 beneficiary households of JSFV. According to the information provided by T-cup, total 10 families returned from India as of 22nd January, 2007. They made up their mind to return as the living condition of the refugee camps in India was beyond their endurance. Change of the living places of the beneficiary form June to December 2006 is presented in the table below.

Table : Places of stay – Beneficiaries of Iqbal Nagar

Name of the camp	Total beneficiary households	Stay at welfare camps			Moved to relatives' places in Trincomalee			Moved to India			Moved to other districts in Sri Lanka		
		10-Dec	20-Sep	14-Jun	10-Dec	20-Sep	14-Jun	10-Dec	20-Sep	14-Jun	10-Dec	20-Sep	14-Jun
Thamaraikulam (M)	85	54	54	54	31	31	31	0	0	0	0	0	0
Iqbal Nagar (M)	25	4	7	14	21	18	11	0	0	0	0	0	0
Periyakuram (T)	76	27	29	62	14	15	9	29	29	4	5	3	1
Adambodai (T)	26	0	0	20	11	11	4	15	15	2	0	0	0
Veloor (T)	29	12	12	25	6	4	4	11	13	0	0	0	0
Out of the camps	5	0	0	0	5	5	5	0	0	0	0	0	0
Total	**246**	**97**	**102**	**175**	**88**	**84**	**64**	**55**	**57**	**6**	**5**	**3**	**1**

Note: (M)= Muslim camp, (T)= Tamil camp

Source: JICA Project Tam & T-cup

started in Mutur in early August 2006, the security situation became extremely worse, and "traveling" became risky to the beneficiaries, especially for Tamils, as they were checked at the checkpoints, being suspected as LTTE sympathizers. As a consequence, they found the construction site of the JSFV was a safe working place, to where they can travel walking or by bicycles. However, the economic condition of the beneficiaries did not improve so much, as there were few employment and business opportunities due to the unpleasant security situation. Frequent fishing van is one of the causes.

The living condition of the beneficiaries, especially those who live in camps, became worse when the rainy season started in October 2006. Under the situation all the beneficiaries, especially those who are living in temporary huts in the camps, are very keen to settle down in the permanent houses in JSFV without further delay. The families, who were displaced in India and other places, hope to come back and settle in the JSFV as soon as the security situation becomes normal.

Welfare Camp in Iqbal Nagar

2. Hijra Nagar

Living condition of the beneficiaries of Hijra Nagar also became worse after one year from the time of the Tsunami. The beneficiaries who were living in their relatives' places felt uneasy to keep on living together, and had to leave from the places and find temporary huts or tents to live in. Heavy rain in late 2006 affected the living condition of the families who lived in temporary huts and tents. Detailed socio-economic situation of the beneficiaries is described in the results of the family profile survey conducted in August 2006.

At the end of September 2006, eleven people were killed near Pottuvil town, and security situation suddenly became tensed. Very unfortunately, five of them were sons and relatives of our beneficiaries. From September to October, 2006, general strikes were declared several times and there were conflicts between the people in Pottuvil and the Special Task Forces.

The beneficiaries became more worried about the security situation and the progress of the construction work of the JSFV. In November, 2006, three tractors working in the construction site of the JSF-Hijra Nagar was stolen by the LTTE and the construction site was closed for several weeks until the beginning of January 2007. Same as in Iqbal Nagar, the beneficiaries, especially those who live in temporary huts and tents, are very keen to settle down in the permanent houses in JSFV, without further delay.

A Beneficiary Living in a Tent

Appendix 4 Water Supply System of HN-JSFV

1. Temporary Water Supply Plan

1.1 Water Source Exploitation

Since the existing water supply system is unavailable in Pottuvil area, HN-JSFV had to explore a new water source.

Several water sources were analysed as shown below and it was found that the tube well dug along Kunchanodai River was only suitable in terms of quantity and quality.

Table Alternative Water Sources for HN-JSFV

Water Source	Restricted factors for water supply plan
1. Wells in the site of HN-JSFV	Quantity as well as quality of tube wells are not suitable.
2. Rottai Tank	• Permission from Irrigation department is difficult to be issued. • Improvement Work of the Rottai Tank is requested. • Water purification plant is required.
3. Siriya irrigation channel	Same as Rottai Tank
4. Dug wells along Siriya channel	Same as Rottai Tank except for water purification plant construction
5. Kunchanodai River	Same as Rottai Tank
6. Dug well along Kunchanodai River	Water quality cannot satisfy the Sri Lankan standard. (SO_4)
7. Tube well along Kunchanodai River	• Water yield is more than 700 litres per minute. • Water quality cannot satisfy the Sri Lankan standard (PO_4). However, it satisfies Japan/WHO water quality standard.

However, NWSDB does not recommend using the dug well along Kunchanodai River as a drinking water, NWSDB agreed to supply drinking water by water bowser and other domestic water is supplied from the well without treatment.

1.2 Service Population and Water Demand

Estimate of the service population and water demand of HN-JSFV and adjoining villages are shown below.

Table Design Population

Site Name	Served household	Served population	Water demand
Hijra Nagar Japan-Sri Lanka Friendship villlage	200 families	1,000 persons	100m3/day
World bank project	94 families	470 persons	47m3/day
World vision project	26 families	130 persons	13m3/day
Others		140 persons	14m3/day
Whole Hijra Nagar area		1,740 persons	174m3/day

Note: unit water demand is assumed to be 100 lit/capita/day.

1.3 Water Supply Plan

HN-JSFV water supply facility is summarized in Figure A.5.1. This facility is the temporary due to inappropriate water quality including PO. After the completion of Pottuvil water scheme being developed by USAID and International Federation of Red Cross (IFRC), the temporary water facility of HN-JSFV will become the permanent by connecting the Pottuvil water scheme.

(1)	August/2007 ~ Completion of Pottuvil water scheme	Drinking water : NWSDB water bowser, Bathing and washing water : USAID well →Elevated water tank inside HN-JSFV site → Household
(2)	After completion of Pottuvil water scheme	USAID water purification plant (Arugam Bay) → Elevated water tank inside HN-JSFV site → Household

2. Outline of Permanent Water Supply Plan (Pottuvil Water Scheme)

2.1 Background and Project Scheme

Pottuvil water supply scheme is one component of Sri Lanka Reconstruction Program, which is the rehabilitation program for Tsunami affected people. Water supply scheme covers Pottuvil town, Panama town, and Komali town. USAID and Sri Lanka Red Cross Society (SLRC) are funding the project. USAID is responsible for water resource development and water purification plant construction, while SLRC is responsible for distribution pipeline system starting from the water purification plant. Implementation of the project is from September 2005 to Middle of 2009.

2.2 Details of the Project

(1) USAID Program

USAID plans to develop 6,000 m3/day of drinking water for Pottuvil town. In the original plan, they develop two tube wells along the Kunchanodai River, which is located at the northern side of Pottuvil town. However, the plan was discarded because they could not develop two tube wells within the project period. They revised the water supply plan and plan to drill seven tube wells in Arugam Bay Area to supply water to Pottuvil town. Project implementation schedule is planned as follows:

Table Implementation Schedule of USAID Program

No.	Work Stage	Implementation Period
1	Feasibility Study	~ Sep/2006
2	Detailed Design	Oct/2006 ~ Dec/2006
3	Tendering	Jan/2007 ~ Feb/2007
4	Construction	Mar/2007 ~ Aug/2008

Source: USAID

Figure A.5.1
Temporary Water Supply Plan for
Hijra Nagar JSFV

(2) SLRC Program

SLRC is the implementation agency for pipeline system providing only the fund source. SLRC sublets the design work to NWSDB and NWSDB designs and constructs each distribution system. NWSDB has already identified the target supply area. SLRC prepared the technical proposal of the design consultant selection as of September 2007. They plan to complete the detailed designs and tendering by January 2008 and the construction will start from February 2008. The construction period is 1.5 years so that all the water supply facilities will be completed around the middle of 2009.

Flow diagram of Pottuvil water scheme planned by NWSDB is as presented in Figure A.5.2.

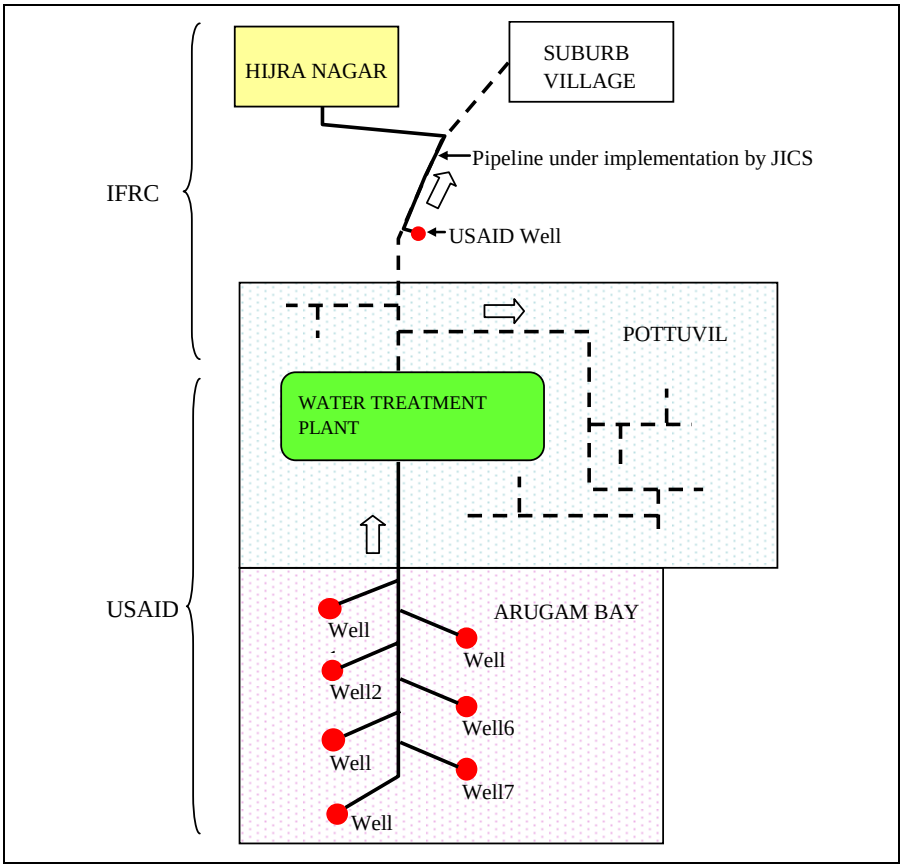


Figure A.5.2 Flow Diagram of Pottuvil Water Scheme

Appendix 5 Evaluation of KTRP

Item	Problem/Evaluation	Recommendation for Township Redevelopment
Scope of Study	- Needs for reconstruction of Kalmunai township were identified as livelihood restoration/improvement, flood problem settlement, solid waste disposal including debris final clearance and rehabilitation of Thonas, lagoon drainage, after the discussions in local committee meetings. - In line with the progress of recovery and rehabilitation work by NGO and UN agencies, evacuation camp and transitional houses were already planned and constructed.	- Needs for rehabilitation and reconstruction against disaster damage rapidly changes. Continuous assessment of needs is necessary. To reassess needs community and local government participation is most important.
Needs of Local Industry Rehabilitation and Activation	- DCKTR (District Committee of Kalmunai Township Redevelopment) members of community representatives and local government officers understood and highly evaluated the method of local industry rehabilitation by utilization of unused local resources and progressively participated into the pilot projects. - Quality of products made on the basis of idea and contrivance of community group members were appropriate and exhibitions in Colombo and the international airport were successfully done.	- Sales to both domestic and overseas tourism market should be promoted to nurse the locally specific products of Kalmunai. - Scheme of the pilot project can be replicated to other affected area of Sri Lanka.
Ethnic Harmony	- Equal benefit should be considered to both ethnic groups. Since land ownership is sensitive matter, land contribution should be shared fairly by both ethnic groups in the project design. Memorial park, for instance, is planned to locate in-between Tamil and Muslim territory.	- Both burden and benefit of the project development should be shard equally by Tamil and Muslim.
Co-assistance	- To apply community participation planning of redevelopment of Kalmunai Township, local committee, DCKTR chaired by additional GA with participation of ethnic communities, local governments, economic society and academia was formulated. - DCKTR were held five times in the year of 2005 in collaboration with JPT. - Autonomic DCKTR was held in 2006 without JPT assistance to examine the plans of memorial park, Thonas redevelopment and local industry rehabilitation plan. Explanation to the Kalmunai Township Council was also conducted by DCKTR in 2006.	- Local community is actively involved for township development, and public service development. - Capacity building of local community was preliminarily made through DCKTR, then follow up to implement the plan is important. Monitoring and continuous support are recommended.
Security	- Intermittent ethnic confrontation happened in north-eastern area, JPT could not enter Kalmunai Township occasionally. - DCKTR was held in Ampara Township, where the security was comparatively normal, however member of DCKTR found the difficulty to reach Ampara from Kalmunai due to the problems of transportation between two townships.	- Sufficient period is to be arranged for encounter the security problem to work with local community and local government.
Project Proposal Implementation	- Although Yen loan was requested for the Kalmunai redevelopment, this priority project has not been taken up by JBIC.	Continuous exchange of information between JICA and JBIC is necessary for smooth implementation as well as coordination under the Task Force.

Appendix 6 Check List for Implementing Resettlement Housing (In case of Japan Friendship Village Project)

Stage	Necessary Works	Critical path	Related Organization												Urgency			Importance			Documentation					Remarks
			GOJ	JICA	JICS	UN-Agency	Donor	GOSL-CG	GOSL-LG	Gov.-Agency	Env. Authority	Achademic org.	NGO	CBO	JPT	Urgent	Early	Normal	Essential	Important	Normal	MM	MOU	Letter	Report	Others	
I. Preparatory Stage	I.0 Needs Surveillance		○	○		○	○	◎											✓							✓	Needs should be reviewed repeatedly.
	I.1 Request for assistance	I.0	◎			○	○	◎								✓			✓					✓			
	I.2 Project Design mission	I.1		◎	○			◎								✓			✓						✓	✓	
	I.3 Scope of Work agreement	I.2		◎	○			◎								✓			✓			✓					
	I.4 Confirmation of aid principles			◎				◎									✓		✓				✓				Ownership of house retaining in the public organization at leaset 10 years.
	I.5 Survey for site selection	I.3						○	○	○	○				◎	✓			✓						✓	✓	
	I.6 Site survey of topography/boundary	I.5													◎		✓		✓						✓	✓	
	I.7 Land transfer from DS to dev. agency	I.6						○	◎	◎								✓	✓					✓			
	I.8 Confirmation of land dev./building permission procedure							◎							◎			✓		✓			✓				
	I.9 Determination of beneficiaries	I.5							◎							✓			✓					✓			Disclosure of beneficiaries list is effective for finalization.
	I.10 Public announcement of the commencement of project	I.2		○				◎							○		✓			✓						✓	
II. Planning/ Design Stage	II.1 Formulation of basic plan (land use & house design, common facility, infrastructure, etc.)	I.5, I.9								○					◎		✓		✓							✓	
	II.2 Plan explanation/agreement with beneficiaries	II.1							○	○				◎	◎		✓		✓				✓				
	II.3 Housing type selection	II.1							○	○				◎	◎		✓		✓				✓				Alternative type of housing is desirable.
	II.4 Community harmonizing activity	I.9							○					◎	◎		✓			✓			✓				
	II.5 Agreement with neighboring community	II.2							○	○				◎	◎		✓			✓			✓				
	II.6 Community Profile Survey	I.9							◎					◎	◎		✓		✓							✓	
	II.7 CBO empowerment (Organization Dev.)	II.6												◎	◎		✓		✓							✓	
	II.8 CBO empowerment (Conducting livelihood activity)	II.7							○					◎	◎		✓		✓						✓		
	II.9 IEE analysis /environment permission clearance	II.1, II10									◎				◎	✓			✓					✓			Approval by CEA
	II.10 Design approval of infrastructure, utility, facility	II.1						◎		◎					○		✓		✓					✓			Approved by MOHC, NHDS, NWSDB
	II.11 Development approval	II.1								◎					○		✓		✓					✓			Approved by UDA
	II.12 Approval of site clearance	II.11								◎					○		✓		✓					✓			Approval by Forest Department
III. Construction Stage	III.1 Tender document preparation	II.10			◎										◎			✓	✓						✓		
	III.2 Approval of pre qualification of contractor				○			◎										✓	✓					✓			
	III.3 Tender of contractor	III.2			◎			○							○			✓	✓							✓	
	III.4 Tender evaluation and negotiation, contract	III.3			◎			○							○			✓	✓							✓	
	III.5 Site clearace				◎										○			✓	✓							✓	
	III.6 Geologic Survey/design of Water resource exploitation	II.11,II.12					○	○	○	○	○		○		◎			✓	✓							✓	Electric conductivity survey is possible after the bush clearnace of the site.
	III.7 Earth work	III.4			◎													✓	✓							✓	
	III.8 House construction	III.6			◎													✓	✓							✓	
	III.9 Utility, facility construction	III.6			◎													✓	✓							✓	
	III.10 OM responsibility demarcation (discussion)	III.8							○	○				○	○			✓		✓			✓				NWSDB, RDA, RDD, CEB, PS, etc.
	III.11 Building permit, legal registration	III.8						○	◎					○				✓	✓					✓			
	III.12 CBO empowerment (for resettlement.)	III.7							○									✓	✓							✓	
	III.13 Conducting livelihood activity(follow up)	II.8											○	◎	◎			✓		✓						✓	
	III.14 Beneficialies participation in construction	III.13												◎	○			✓		✓						✓	
	III.15 Allotment of house/plot to beneficiaries	III.7							◎					◎	○			✓	✓							✓	
IV. Completion/Resettlement Stage	IV1 Handover of house, plot	III.15	○	○				○	○					◎	○			✓	✓					✓			
	IV.2 Training of CBO for OM	III.9,10,11								○				◎	○			✓		✓						✓	
	IV.3 Follow up (CBO support, livelihood improvement)			○				○						◎				✓		✓						✓	
	IV.4 Follow up (Neighboring community empowerment)			○				○						◎				✓		✓						✓	

Source: JICA Project Team

Note: ◎ Responsible Organization ○ Cooperating Organization