

1 CHAPTER 1 : INTRODUCTION

1.1 Background of the Plan

The Physical Plan for the Eastern Province has been prepared by the National Physical Planning Department (NPPD) in terms of the provisions of the Town and Country Planning Ordinance No.13 of 1946 as amended by Act No.49 of 2000.

The preparation of a physical structure plan for the Eastern Province was awarded to the Environment and Management Lanka (Private) Limited (EML) by the National Physical Planning Department (NPPD). EML Consultants engaged an experienced team of consultants including several specialists from the Province with in depth understanding of the local situation. The Planning Team worked closely with officials of the NPPD, the Ministry and other officers of government departments, corporations, the Provincial Council, local authorities and other stakeholders from the province.

The team visited the province a number of times and had discussions with the respective District Secretaries and relevant officials and the other major non-governmental organizations to obtain their views and suggestions. A participatory approach was adopted by EML in developing the plan. Involvement of stakeholders from the beginning itself ensured local participation and acceptance and enabled the incorporation of the views of professionals and regional experiences in the process.

1.2 Approach and Methodology

An integrated approach was used to develop planning and implementation strategies for the physical plan because of the multidisciplinary nature of this exercise. The primary objective was to develop a plan that would utilize the physical and natural resources of the region in a sustainable manner to obtain the optimum benefits for the population of the region. Thus the focus was on optimal development of the physical infrastructure of the region to support rapid socio economic growth while ensuring the conservation of the natural environment. Both rural as well as urban development and conservation aspects were considered in the planning exercise.

1.3 The Planning Process

Each component of the planning process, which was based on an "integrated approach", was considered to be of equal importance, as all these components are inter-dependent. The final plan was formulated after taking into consideration the following factors:

Objectives of the assignment: understanding the scope and tasks of the assignment as per TOR;

Stakeholder views: professional knowledge, data available and specific objectives;

Time schedule for completion of the implementation of the proposed activities.

The Planning Process followed by the Team is illustrated in Figure 1. The plan preparation process was divided into the following four phases.

Phase 1: Literature review and \database preparation;

Phase 2: Preparation of the current Land Use Plan, and other spatial data layers;

Phase 3: Field visits to verify data and study the socio economic, cultural and environmental aspects related to development;

Phase 4: Preparation of the Physical Structure Plan for the Eastern Province.

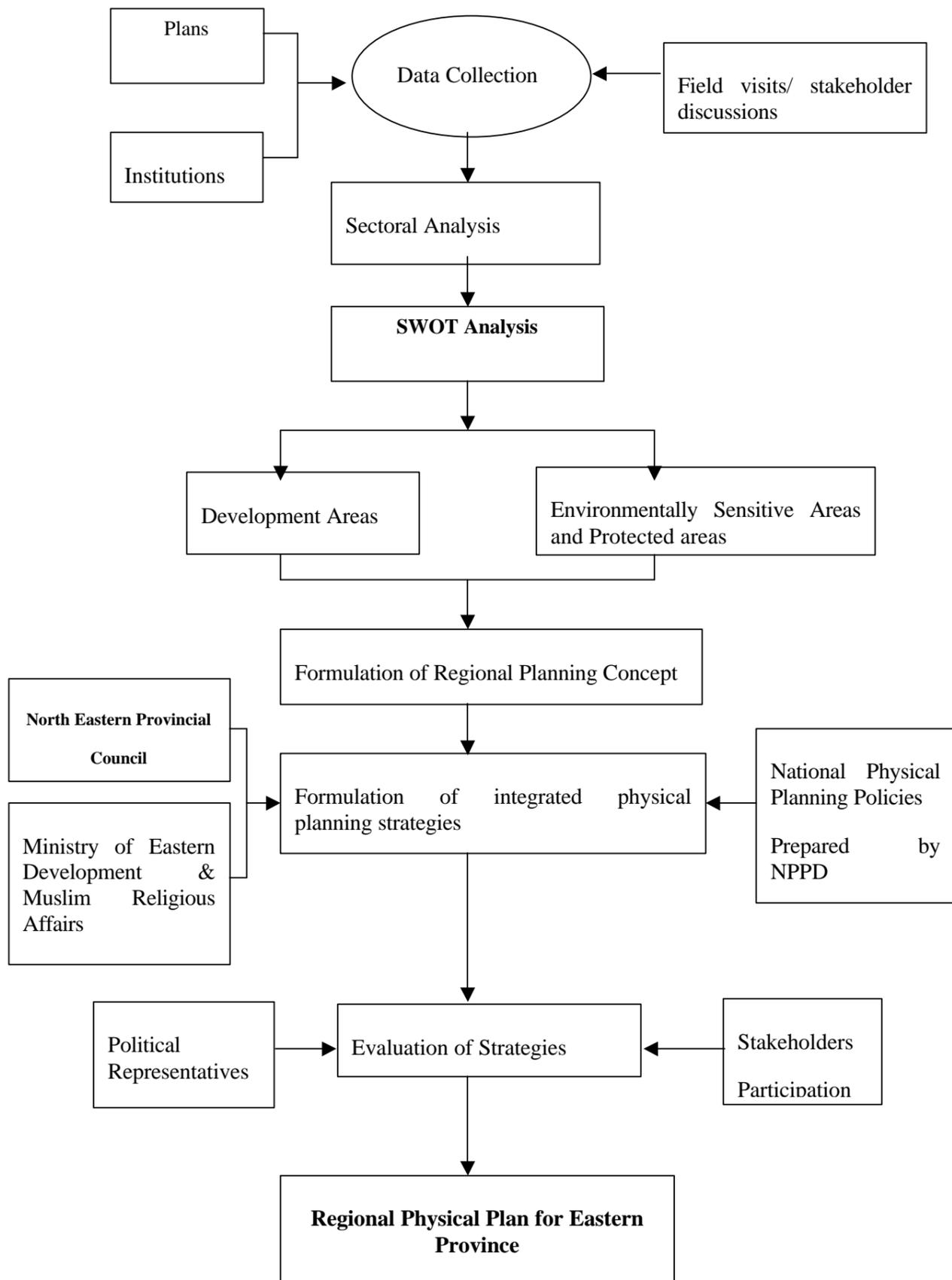
Phase 5: Preparation of the Sectoral Development Plans for the Eastern Province

1.4 Planning Team

The team of consultants engaged in the preparation of the physical plan is listed below. The team was assisted by the progress monitoring committee set up by the National Physical Planning Department with valuable comments and recommendations.

Name	Position
P K S Mahanama	Urban / Regional Planner (Team Leader)
Prof S Mookaiah	Urban / Regional Planner
Mr Madhura Prematilake	Urban Designer/Architect
Dr. Saman Bandara	Transport Planner / Engineer
Mr Conard H Tissera	Urban Infra. Consultant / Water Supply & Drainage Eng.
M Subramaniam	Urban Infra. Consultant / Power & Energy and Telecommunication
Eng A Subakaran	Urban Infra. Consultant / Solid Waste Management/Project Manger
Mr M G M Razzak	Social Infrastructure Specialist
Dr Mrs S De Silva	Health Infrastructure Specialist
Dr T Jayasingam	Environmentalist
MR Ahamed Nazir Ahamed	Agriculturist
Dr P Vinobaba	Aquaculture Specialist
Dr Ms J Sinniah	Animal Husbandary Specialist
Eng K Vadivel	Irrigation Engineer
Mr K Thambiah	Economist
Dr S M F Marikkar	Economist
Mr K A K Jayatilake	Institutional Development Specialist
Mr J Dias	Port Planner
Prof S Seneviratne	Archeologist
Asoka Alwis	GIS Specialist
Dr Manitha Weerasuriya	Technical Support – Agriculture
Ms Wietske Medema	Technical Support – Institutional Development
Ms Indhu Weerasuri	Technical Support – Tourism

Figure 1-1: Planning Process



2 CHAPTER 2 : DEVELOPMENT OF PHYSICAL PLAN FOR THE EASTERN PROVINCE

2.1 Introduction

The Eastern Province covers an area of about 10,000 square kilometers, which is about 15% of the total land area of the country. The province comprises of three districts, the largest is Ampara district with an area of about 4400 sq. km. The other two districts are more or less equal in area with Batticaloa district having a slightly larger area of about 2850 sq.km., while Trincomalee has an area of 2700 sq.km. The topography of the province is relatively flat in the coastal areas and undulating in the western part of the Province. The landscape of the Province is varied, with paddy fields, forests, scrublands, wetlands and lagoons being predominant.

The population of the province is about 1.5 million, which is about 6.7% of the total population of Sri Lanka. About a third of the population of the Province live in a relatively smaller area, classified as urban by UDA.

The Eastern Province is relatively less developed in comparison with most of the other provinces in the country. Development in the province has suffered as a result of the ethnic conflict that has continued over the last twenty-year period. The region is endowed with natural resources such as forests, wetlands, lagoons, bays and beaches. The large number of ancient water bodies that are found scattered over entire landscape of the Eastern Province, suggests that this region had been developed extensively from historic times. This is further evident by the presence of a large number of ancient structures of historical interest in the area. (See Map 2-1)

The regional economy is largely dependent on agriculture, with paddy as the main agricultural crop. Even during the pre-colonial era, the province was a surplus rice producing area contributing approximately a third of the country's paddy production, thus being known popularly as the "Granary of the Island". Currently there are 124 major irrigation schemes (over 40 ha), including 43 settlement schemes in the province, providing irrigation water for 134,726 hectares of land. Livestock farming is another traditional economic pursuit in the province.

The contribution of the Eastern province to the national GDP has remained around 5% of the total over the last five-year period. A comparison of the contribution to the national GDP made by different provinces in year 2000 is presented in Table 2.1. The contribution of the Eastern Province was 4.5% and it was above that of three other provinces, namely, Uva, North Central, and Northern Provinces.

An analysis of the sectoral contribution to the GDP of the Eastern Province in the year 2000 shows that agriculture including fisheries, forestry, and mining and minerals contributed 35% to the GDP. The service sector contributed 47% to the GDP, and included trade and tourism 19%, transport and communication 11%, and other services 17%. The industry sector contributed 18% and included manufacturing 7%, construction 10% and electricity 1%. Thus the main contributors to the regional economy are agriculture, trade and tourism, transport and construction. These sectors were, relatively more important to the economy with a large percentage (about 80%) of the population dependent either directly or indirectly, for their livelihood in these activities. The unemployment rate in the Eastern Province is about 13.8 %.

2.2 Vision for the Eastern Province

The Eastern Province by 2030, will be a vibrant "SUN RISE REGION" with a sound regional economy with enhanced income levels and a socially harmonious human settlement structure while maintaining the uniqueness of the Province, in terms of its natural landscape, its history, its culture and its bio-diversity.

Table 2-1 GDP Share by Province in 2000

Province	GDP share %
Western Province	49.4
North Western Province	10.4
Central Province	9.9
Southern Province	9.3
Sabargamuwa Province	6.7
Eastern Province	4.5
Uva Province	4.0
North Central Province	3.8
Northern Province	2.1
Total	100

Source: Department of National Planning

(A) Sound regional economy

The Eastern Province has the potential to achieve high growth, as the province is endowed with sufficient natural resources and opportunities for economic advancement. For example, the Trincomalee Port, which is a large natural harbor, is a resource with very high potential for development. This port could be transformed into a major commercial hub for the South Asian region. Tourism is another area with great potential in the province. The province boasts large stretches of beautiful beaches and calm seas, which can lure a large number of tourists to the region. As a bonus, there are plenty of sites of cultural and historical importance and wild life and ecological conservation areas that can attract the eco and cultural tourists on a large scale, provided that the necessary infrastructure is in place. The rural hinterland with large stretches of high potential agricultural lands and low population densities can be developed for high intensity and highly productive agricultural enterprises. The productivity of existing irrigated agriculture can be increased through improved water management, the provision of additional sources of water and rehabilitation of existing tanks as well as construction of new ones. Income from livestock and fisheries activities can be raised substantially, through the development of additional infrastructure and services. Such activities can supplement income from agriculture and other trade and commercial activities of the population. Land use can be intensified by mixed farming, while at the same time smoothing the income pattern of crop agriculture production. Currently the urban town centers and the coastal belt provide much of the employment opportunities due to the concentration of economic activities in these limited areas. This can be reduced with greater spatial spread of development activities, which can expand employment opportunities to the rural areas.

(B) Social Harmony and Cultural Diversity

Social harmony is important for sustaining development activities. The fact that there exists a diverse community within the Eastern Province, necessitates that high priority be given to achieving social harmony, if the development process is to proceed forward and the stated objectives attained. Also one may consider socio-cultural diversity as a strength rather than a weakness, as such diversity can be advantageous when implementing a large scale development effort, provided that the social programme can be managed effectively. The strengths of each community, cultural or social group should be harnessed for development and the establishment of a stable human settlement. A concerted effort must be made to reduce existing social tensions and minimize further disharmony, through the development efforts identified under the plan. It is important that the development plan, give sufficient consideration to social issues in the province and facilitate the resolution of these issues to minimize further tensions and move the development effort forward.

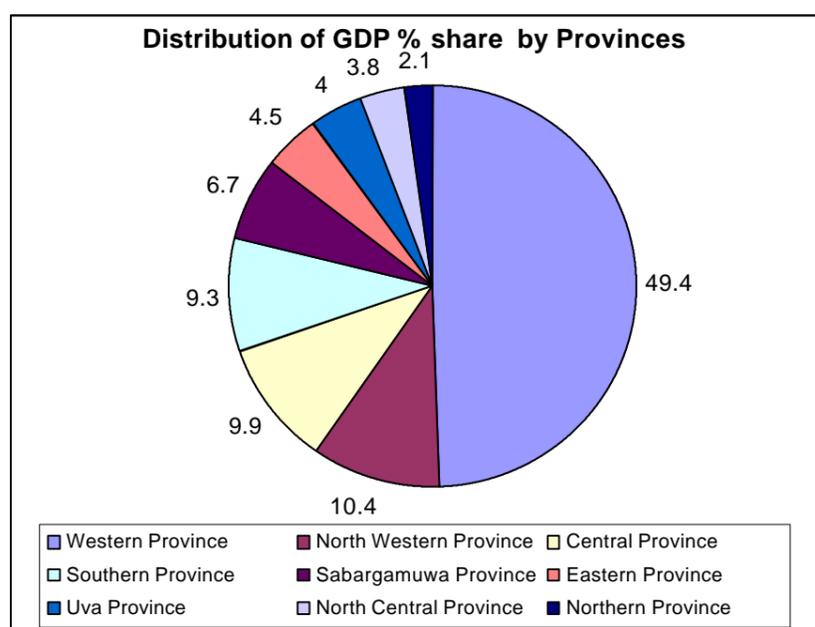
(C) Unique physical and undisturbed environmental setting.

The Eastern Province can be considered as a region with a unique **physical and environmental setting**, which can lend itself to many innovative actions. This unique environment in the Eastern Province

Map 2-1 Land Cover of the Eastern Province

Map 2-2 Environmental Sensitive Areas of the Eastern Province

can be attributed to a number of socio, cultural and environmental factors that include, a blend of a well-defined population distribution, diverse forest and wildlife, wetlands and greenery, attractive water front environment, heritage and historical monuments, as well as a spread out rural settlement. The sandy beaches in the East Coast such as Pasikudah, Nilaveli, Marble Bay and Arugam Bay can be classed among the best waterfronts in the world. The East Coast seas are relatively calm compared to the South West Coast and are less polluted and the waters can be accessed almost 10-11 months of a year except during North East monsoons. About 26% of the country's coastline from Moderagam Aru to Kumbukkan Oya falls within the province. Eastern province has a large number of archeological sites, which are important as cultural heritage sites. The historic forts and buildings of the colonial era in Trincomalee and Batticaloa have been well preserved. The province boasts a large number of cultural and religious sites including Deegavapiya, Buddangala, Thiriyaya, Muhdumahaviharaya, Seruwila, Gokanna Vihara, Thirukoneswaram Kovil, Maraiamman Pillayar Kovil, Sittandi Mandur. These sites have a high potential for development as cultural historic sites of value for local as well as foreign visitors.



2.3 Objectives of the Physical Plan

The following objectives based on situational and SWOT analyses were developed, in order to realize the above vision for the Eastern Province.

To improve the socio-economic conditions in the region while protecting the environment, including the sensitive areas and marine & coastal ecosystems;

To restructure the regional economy in line with its resources;

To make optimal use of physical and natural endowments in a sustainable manner;

To promote development areas based on industrial, port, fisheries, tourism and agricultural development;

To enhance economic growth in rural areas through development of non-farm activities.

To create an attractive economic environment for private sector investment;

To improve inter and intra regional mobility;

To enhance social harmony and equity and minimize intra-regional imbalances;

2.4 Planning framework

The phased approach was adopted in planning for the development of this region, for various reasons. Primarily it was felt that since the social as well as physical infrastructure of the region had become run down or dilapidated due to the conflict, there was a need to rebuild and restore this infrastructure to operating levels. Unless this was done the economy would not be able to operate optimally. Thus the first phase of the plan would cater to this need of enabling the economy of the region to operate normally. The second and third phases of the plan would then work towards enhancing growth, income and employment, with the development of the region's unexploited resources through new projects and programmes identified in each sector. The second and third phases would cater to the fulfillment of several socio economic and environmental goals, taking into account the existing natural state of the province. Hence, the planning framework we adopted can be described as three-phase approach to take the Eastern Province from its current state to one with high economic turnover, a high living standard, environmental sustainability and socio political stability. The first phase is the recovery phase, followed by the second transition phase and thirdly the steady development phase.

The so-called Recovery Phase will be for restoring the regional economy to normal levels. Due to the conflict situation, the economic growth in the province has been very erratic. Some years of high growth have been followed by negative growth. When compared to other provinces in non-conflict areas, the performance has been weak. The combination of a weak economy and run down physical, economic and social infrastructure, has resulted in a low level of growth. Therefore, priority would be given in the plan to develop the province to a level equal to other regions in terms of socio-economic and physical development. The plan will propose activities to restore the run down physical and social infrastructure to operational levels, to enable the province to recover to a level that would initially meet the basic needs of the people in the region and secondly improve services of the government and private sector to normal levels, or at least to levels prevalent before the conflict. However, most services would be modernized to current standards, as it would not be meaningful or feasible just to restore services to earlier prevailing levels. It is proposed that all the activities under this phase would be completed by the end of the year 2010. However, it is more likely that these activities will extend to the other phases, since the scope and magnitude of the restoration activities are quite extensive. Activities, which extend into the other phases would be considered ongoing activities and in principle will be Phase 1 activity

In the Transitional Phase the groundwork and infrastructure necessary for implementing longer-term development activities will be undertaken. This phase will also commence at the same time as Phase I, but the actual work on project activities would be undertaken during the period 2011 – 2015. Activities for recovery will be upgraded to major infrastructure and income generation projects during this phase. During the third phase or the Steady Development Phase, programs will be implemented to achieve long term development targets that will drive the Eastern Region towards the final goal of achieving high economic growth and improved living standards, environmental sustainability and socio-cultural stability. The proposed phases are described more fully in the following chapters.

2.4.1 Recovery Phase

There is general consensus among the stakeholders that rehabilitation and reconstruction activities must be given high priority. However it is important that these recovery activities are in line and agreement with the medium term and long – term plans proposed for the Province.

The infrastructure in the Eastern Province is greatly dilapidated and needs significant rehabilitation, reconstruction and development. These problems stem from damage due to the conflict, deterioration of service condition due to lack of maintenance, and stagnation in development and improvements compared to the rest of the island. Rehabilitation will greatly contribute to, and underpin, improvements

in the living conditions of people, including resettling populations and other vulnerable groups with greater success.

In general, the availability of expertise and institutional capacity to undertake a major development effort in the Eastern Province appears very limited and early efforts must be taken to action them.

The issue of accommodating the internally displaced families (IDF) who wish to return to their original places has to be addressed as a matter of urgency. Some of the displaced persons remain within that region while some have moved to other parts of the island but intend to return. In addition there are few numbers of displaced families outside Sri Lanka, who may or may not return but may continue to maintain links with the Province, thus influencing the economic recovery.

It is also clear that the visible reactivation of development, and expansion of opportunities, which are so important for renewed hope and optimism, is severely constrained by the depressed state of the private sector in the province. Therefore local enterprise development will be the key to the effective implementation of economics activities based on agricultural, forestry and fisheries resources.

In this background the Eastern Province has to go through a process of reconstruction before embarking on a meaningful development process. Production and productivity improvement to agriculture, livestock and fisheries, and the expansion of agricultural diversification, processing and value addition are vital. A strategy for rapid employment generation will be to focus on stimulating productivity growth in all sectors, particularly in the agriculture sector. It is expected that the Agriculture sector recovery will induce demand-propelled expansion in many other sectors.

2.4.2 Transitional Phase

It is expected that during this phase the groundwork will begin for rapid growth as the immediate problems prevailing in the province will be resolved. Major programs of new infrastructure development are proposed to accelerate the development process. There is a desire that it should provide facilities to support commercial, industrial, fisheries and agricultural development. For example, development of Trincomalee industrial port can be one such major proposed project in the Transitional Period. This project alone will create significant development potential for international export/transshipment trade, ship repair, petroleum product storage and distribution, ship chandelling and bunkering, tourism, general cargo and bulk cargo handling, coastal shipping, and for stimulating land side development in the rest of the province.

This has to be supplemented by an ambitious program to develop the transportation, power, communication and the financial services sectors. The coordinated development of infrastructure that reinforces rural-urban linkages and connects product and factor markets will be a key requirement

2.4.3 Steady development phase

Primary character of the economy will need structural change towards value added processing of regional produce and the development of new products. The human resources and skills needed for growth and structural change, and suited to the needs of a dynamic market economy, will be improved and expanded. Explicit recognition must be given to the issues of social harmony and environmental stability by giving priority to balanced sub-regional development and effective resource management.

3 CHAPTER 3: REGIONAL GROWTH PROJECTIONS FOR EASTERN PROVINCE

3.1 Population Growth and Distribution

The past trend in population growth in the Eastern Province between 1981 and 2001 is presented in Table 3.1. The population of the province grew by an average of 2.2% over this period. Within the province, the Batticaloa district had the highest growth rate of 2.5% followed by Ampara with 2.1% and Trincomalee with the lowest rate of 1.9%. (Table 3.2). Population projections were estimated in order to evolve a planning strategy for the Eastern Province based on the vision and existing socio economic background

Table 3-1 Population Growth in Sri Lanka and Eastern Province

District/ Region	Population		Rate of increase of population per annum 1981- 2001	Absolute increase of Population 1981- 2001
	1981	2001		
Eastern Province	975,251	1,504,998	2.19	529,747
Other Provinces	13,889,525	18,590,706	1.26	4,701,181
Sri Lanka	14,846,750	20,020,909	1.14	5,174,159

Source: Census and Statistics Department, Census of Population 1981 and 2001

Table 3-2 Population Growth Trends of Eastern Province 1981 to 2001

District	1981	2001	Growth rate % per annum From 1981 to 2001
Ampara	388970	589,341	2.10
Batticaloa	330333	540,445	2.49
Trincomalee	255948	375,212	1.93
Eastern Province	975251	1,504,998	2.19

The Geometric Growth Model was used to estimate the population projections for the Eastern Province using past trends. The individual district average growth rates for the Ampara, Batticaloa and Trincomalee Districts were used for estimating the population projections. The population projections are shown in Table 3.3. The population projection has taken into account both the natural population growth trend in Sri Lanka, which was quite low at 1.50% in 2001 and internal migration. Accordingly, the population of the Eastern Province is expected to grow from 1.5 million in 2001 to 2.9 million by 2030 at the growth rates mentioned above. It is envisaged that Eastern province will accommodate more in-migration from other regions of Sri Lanka (See Table 3.3).

The Table 3.3 below shows that the population at present is unevenly distributed within the Eastern Province. The province is very densely populated in pockets along the coastline, while other areas remain sparsely populated. It is therefore desirable to promote growth and design development projects that would allow and encourage a better distribution of the population within the Province. The Plan presented here has made an effort to spread development activities so as to encourage a more even distribution of the population in the future.

Table 3-3 Population Estimates by DS Divisions – Eastern Province 2010-2030 ('000)

District	DS Division	2001	2010	2020	2030
Batticaloa	Eravur Pattu	68164	85000	106000	143000
	Eravur Town	33670	42000	54000	70000
	Kattankudy	39569	49000	62000	83000
	Koralai Pattu				
	Koralpattu South				
	Korapattu Central	89624	112000	143000	187000
	Koralai Pattu North	21234	27000	39000	44000
	Koralai patthu West	25765	30000	40000	54000
	Manmunai Pattu	29059	37000	46000	61000
	Manmunai North	78503	98000	125000	164000
	Manmunai South & Eruvil pattu	56219	70000	90000	118000
	Manmunai South west	24111	30000	38000	50000
	Manmunai West	28316	35000	45000	59000
	Porativupattu	46211	58000	74000	97000
Total		540445	673000	862000	1130000
Amparai	Addalaichchen ai	35779	43000	57000	67000
	Akkaraipattu	34961	42000	56000	65000
	Alayadiwembu	22454	27000	36000	42000
	Amparai	37992	46000	61000	71000
	Damana	34754	42000	56000	65000
	Dehiattakandiy a	62612	76000	100000	117000
	Irakkamam	11442	14000	18000	21000
	Kalmunai	70439	85000	112000	131000
	Karativu	16210	20000	26000	30000
	Lahugala	7587	9000	12000	14000
	Mahaoya	18023	22000	29000	34000
	Navithanveli	17330	20000	28000	32000
	Ninthavur	24673	30000	39000	46000
	Padithyalawa	15648	19000	25000	30000
Pottuvil	28404	34000	45000	53000	
Sainthamaruth u	24018	29000	38000	45000	
Samanthurai	51142	62000	81000	95000	
Thirukkivil	23739	29000	38000	44000	
Uhana	52137	63000	83000	98000	
Total		589344	712000	940000	1100000
Trincomalee	Gomaragadaw ela	7455	9000	12000	14000
	Kanthalai	47056	56000	75000	88000
	Kinniya	49638	59000	79000	93000
	Kuchchaveli	43085	50000	69000	80000
	Morawewa	18713	22000	30000	35000
	Muthur	53710	64000	86000	100000
	Padavisripura	11972	14000	19000	22000
	Seruwila	12772	15000	20000	24000
	Thampalagama m	48526	58000	77000	90000
	Town & Gravets	75484	90000	120000	141000
	Verugal	6800	8000	11000	13000
Total		375211	445000	598000	700000
PROVINCE TOTAL		1,505,000	1,830,000	2,400,000	2,930,000

Source: Population of 1981 and 2001 are based on Census and Statistics Department, NEPC and Census of Population 2001

3.2 Economic Development and Employment Generation

It is expected that real Regional GDP would grow at a rate of between 8-9% during the period 2005- 2015, at 7-8% during 2015 - 2025 and 5-6% during 2025 –2035. The value of real GDP is projected to increase from Rs 44,700 million in 2003 to Rs 118,700 million by 2015, to Rs 250,000 million by 2025 and to Rs 408,000 million by 2035. This level of economic growth can be achieved by a balanced economic strategy, promoting industrial, agro-based, tourism and port-related development through the creation of foreign and local investment opportunities.

Population is projected to grow at an overall rate of 2.2% over the plan period. Based on the above assumptions, the population of the Eastern province is expected to increase to 2.9 million by the year 2030. The unemployment rate is also expected to decline from the current level of 13% of the work force to about 7% by the year 2030. New employment created by the implementation of the plan is expected to be higher than the annual addition to the work force. Details are provided in Tables 3.4 and 3.5 below.

It is projected that about 700,000 new jobs will be created while about 677,000 persons will be added to the work force during the period 2006-2030, as a result of the implementation of the plan. Consequently, the unemployment rate is expected to decline from about 13.5% in 2005 to about 7.0% by the year 2030.

Table 3-4 Projections of Population, Labour Force and Unemployment for the Eastern Province

Year	2001	2003	2004	2005	2010	2015	2020	2025	2030
Population (000)	1505	1571	1606	1640	1830	2100	2400	2700	2900
Pop. Growth Rate %	2.2	2.2	2.2	2.2	2.2	3.0	2.6	2.1	1.6
HH Pop. > 10 years	1050	1100	1130	1200	1300	1500	1700	1900	2100
Labour Force Participation (000)	790	825	843	862	930	1100	1360	1450	1560
No Employed (000)	680	711	729	748	820	990	1240	1330	1450
No Unemployed (000)	110	114	114	114	110	110	120	120	110
Unemployment %	13.9	13.8	13.5	13.2	11.8	10.0	9.0	8.0	7.0
Annual Addition to Work Force (000)	1700	1800	1900	1900	2100	3200	3200	2900	2400
Annual New Employment (000)	1670	1560	1780	1850	2120	3230	3160	2880	2500

Table 3.5 below provides details of the total number of employment created in comparison to the addition to the work force.

Table 3.5 Eastern Province- Projected Employment Growth during Plan Period

Period	Total Addition to Work Force	No. of New Employment Created	Average Annual Addition to Work Force	Average Annual New Employment Created
2001-2005	90,000	84,000	18,000	16,800
2006-2010	100,000	99,000	20,000	19,800
2011-2015	140,000	143,000	28,000	28,600
2016-2020	159,000	159,000	31,800	31,800
2021-2025	152,000	152,000	30,400	30,400
2026-2030	126,000	146,000	25,200	29,200
2031-3035	115,000	123,000	23,000	24,600
Total 2001-2035	882,000	906,000	25,200	25,800
Total 2006-2030	677,000	700,000	27,000	28,000

4 CHAPTER 4 – PLANNING CONCEPT FOR EASTERN PROVINCE

4.1 Introduction

The strategy to develop this region should be based on several socio economic and environmental factors that are inherent to the region. The situation analysis on the existing issues, resource strengths, development opportunities and the threats faced by the region indicate that this province has significant potentials and opportunities that should be considered in the development of a physical plan. According to the planning criteria (explained earlier), the Eastern Province can be broadly defined into four major spatial planning areas and three development areas.

4.2 Major Spatial Planning Areas

The identification of major spatial planning areas were based on the functionalities and the natural and physical landscape of the province. Accordingly, 4 major spatial planning areas have been demarcated.

These areas are shown in a schematic diagram in the **Error! Reference source not found.1** .

- The marine and coastal area
- Agricultural production and rural settlement area
- The wildlife rich forest and wetland ecosystems conservation Area
- High density development area with urban centers

4.2.1 The Marine and Coastal Area

The 420 km long coastal area is characterized by the presence of harmonious brackish water bodies (estuaries and lagoons), beaches, bays, sand dunes, islands and coral reefs. Large areas of mangroves and sea grass beds are found in the inter-tidal areas, estuaries and lagoons. Fringing reefs and rocks in Trincomalee bay, Vaharai, Passikudah, and small islands such as Pigeon Island in Nilaveli are also unique ecosystems with high biodiversity values.

Table 4-1 Area under coastal habitats and extent of coastline in Eastern Province

District						Estuaries		
Trincomalee	210	1491	1401	-	671	18317	2180	1129
Batticaloa	100	1421	2196	-	1489	13682	2365	968
Ampara	110	292	127	357	1398	7235	1171	894
TOTAL	420	3204	3724	357	3558	39234	5716	2991

Net accreditation of beach is a common phenomenon in the Eastern Province as the coastal belt is enriched with sand drifting from the sea as well as from the inland sources through rivers flowing into the ocean. The area hosts several fisheries harbors, and the major port of

Trincomalee, which is considered the deepest and largest natural port in the South East Asia. The lagoons in the coastal belt are another important resource that is under stress from urban development.

It is proposed to make optimal use of these resources without harming the eco system in the promotion of tourism and lagoon fisheries. The planned harbours and ports along the coastal belt are expected to be provided with the required piers and anchoring facilities together with the storage and other harbour related operational facilities to obtain the optimum economic benefits from these resources. High priority will be given for demarcating the set backs clearly, to prevent any further development of infrastructure in these areas. The gazetting of the set back limits by Coast Conservation Department and ground demarcation will assist in better conservation of the area.

4.2.2 The Agricultural Production and Rural Settlement Area

The agricultural and plantation activities are the main land use feature of the area that stretches from the north of the region to the south with rivers, streams and irrigation tanks spread across the region. The land, which is predominantly a flat terrain with red-yellow loam and with mosaic of sandy and alluvial soils provides excellent well-drained conditions ideal for crop cultivation. The network of ancient irrigation tanks cascading along the streams and rivers serves as a means of tapping monsoon rains for agricultural and other economic activities.

This area has been earmarked for agricultural activities because of its high potential for increased productivity. Facilities needed, include enhanced input supply facilities and output processing, storage and marketing facilities to sustain high agricultural production. The townships in these areas will be linked through a network of road and main centers with a local rail system to provide ready access to the social and economic facilities that may be available only in the main centers in the region. It is expected that such transport infrastructure will help to meet the socio economic needs of the rural community, who prefer to live in the rural areas. The area is also identified for cluster farm development where the private sector or the government will provide the necessary infrastructure to develop high production areas through integrated farming centers.

4.2.3 The wildlife rich forest and wetland ecosystems Conservation Area

The middle agriculture based area is lined and buffered from the inland areas with an extensive network of forests. These areas need to be maintained for production forestry as well as conservation purposes. As this area is enriched with forests, it will be maintained and further improved for production forestry as well as for conservation purposes, particularly as a wildlife habitat and as a watershed area for many of the river systems that traverse the landscape of the province. The area is also suitable for the development of wildlife and forest based tourism. The infrastructure that may be necessary to support such activities will be provided. Its role as the wildlife habitat and watershed of the river systems can be maintained and managed through a provision of adequate infrastructure. The area will thus provide an excellent opportunity for the development of wildlife and forest based tourism and the infrastructure that may be necessary to support such activities. All features of this area need to be carefully, planned to help uninterrupted migration of large mammals like the Elephants. One of the main reasons for the Human elephant conflict in the country is the fragmentation of the land near animal habitats. These lands need to be consolidated to form larger contiguous areas essential for sustaining wildlife. Such consolidation may be feasible at this juncture, as many areas in the Eastern Province had been abandoned during the past two decades and it may be an opportune time to consider the establishment of the proposed continuous corridor from Ampara to Punani. Apart from these there are many protected areas bordering the Eastern Province viz. Maduru oya, Somawathiya, Trikonamadu, Minneriya, Kadulla, that need to be considered in such a planning.

Map 4-1 Distinctive Spatial Pattern of the Eastern Province

These areas are rich in vegetation, which are of great importance for the conservation of water, the prevention of siltation and for increasing the rate of recharge of tank and groundwater. Additionally, the vegetation helps to avoid flash floods, to prevent erosion and to enable water to be used over a longer period. The estuaries of the river systems with much of the Mangroves, especially near Gangai in Mahaweli, near Panama at Maha Oya and near Kumana at Kumbukkan oya, are also important ecosystems that need protection.

Careful planning is necessary to ensure that corridors for the migration of large mammals like the Elephants, remain open. Fragmentation of the land near animal habitats, is considered a major cause of human-elephant conflict in the country. Consolidation of such land is essential if the wildlife is to be sustained. Since land in this area has been abandoned for more than two decades, it is possible to demarcate large contiguous areas, for the establishment of such jungle corridors. Many riverine ecosystems have been damaged by sand mining or through encroachment. This has led to the collapse of the riverbanks. These areas should be planted with tree species to stabilize the banks. E.g Mundani aru (Batticaloa), Gal Oya (Ampara), Mahaweli (Trincomalee). It is proposed to plant tree species to stabilize such riverbanks. Other vegetation found in the area should be maintained and enriched to reduce silting, avoid flash floods and to sustain mangroves.

4.2.4 High density development area with urban centers

The Urban centers in the province are located mainly along the coastal belt and this seems to be preferred due to the economic opportunities coupled with the transportation facilities available along the coastal belt. The three urban centers, namely Trincomalee, Batticaloa and Ampara, represent the three-district administration centers. These three centers will remain and are expected to become the main growth centers over the next 25 years.

4.2.4.1 Trincomalee industrial and port related development area

The Trincomalee port city, with its major potential to develop into an industrial and commercial center is earmarked under the plan to become the most economically active growth center of the Province. Heavy to medium and import or export oriented industries with emphasis on infrastructure will be promoted in this area. The infrastructure needed to accomplish this target development has been identified and proposed. The urban agglomeration will be formed in combination with the three third order satellite towns of Kantale, Muthur and Kinniya and one 4th order town of Thambalagamam. It is expected that the population of this cluster or agglomeration with a land area of 4980 ha would increase to 521,000 inhabitants by 2030. See Map 4.3.

4.2.4.2 Batticaloa fisheries and tourism related development area

The Batticaloa town is to be developed as a fisheries and tourism related urban agglomeration, because of its high potential for tourism development and fisheries expansion. This town is to be developed as a second order service center by 2030, in the proposed hierarchy of urban centers. The township is expected to achieve economic growth with fisheries and tourism based investment and infrastructure development. The conservation of the Batticaloa lagoon and protection from illegal activities will be a priority activity. These interventions would promote and facilitate tourism and fisheries related activities in the lagoon area. a 2nd order service center of Batticaloa and six 3rd order service centers of Eravur, Vakara, Karadiyanaru, Valaichenai, Kaluwanchchikudy and Kathankuddy. The population within this cluster, with a land area of 5980 ha, is expected to increase to around eight hundred and twenty thousand inhabitants by 2030. See Map. 4.4.

4.2.4.3 Ampara agricultural, industrial and tourism related development area

The Ampara town will be developed as agriculture, industrial and tourism development area. This center is located within the heart of

the agricultural development area and thus has potential to be developed as a center of support for irrigation, agro-based and food processing related industries at both cottage as well as corporate levels. This urban agglomeration will incorporate two, 2nd order service centres and seven 3rd order centers, covering an area of 7970 ha and a population of 787,000 inhabitants by 2030. See Map 4.5.

It is expected that the rest of the population will be distributed among the other fourth and fifth order urban centers in the three districts. These centers will continue to function as nodal points linking the main agglomerations through radial road networks. These urban centers will provide the required economic, social and recreational facilities to the residents of these sub-urban areas. The suburban centers and their economic infrastructure have been planned to suit the socio cultural and environmental aspects that prevail in the area as many of these areas have been identified as having high archeological and religious significance.

Map 4-2 Conceptual Structure Plan for the Eastern Province

Map 4-3 Trincomalee industrial and port related Development Area

Map 4-4 Batticaloa fisheries and tourism related Development Area

**Map 4-5 Ampara agricultural, industrial and tourism related
Development Area**

5 CHAPTER 5: THE PHYSICAL STRUCTURE PLAN

5.1 Introduction

The physical structure plan provides an overall physical development framework for the region and a more detailed plan in selected urban areas including urban designs and action projects.

The main elements of the structure plan are the road networks, main activity centres, major land uses such as residential, industrial, agricultural, environmental conservation and tourism areas, as well as areas for special uses. Detailed action plans have been drawn up for selected urban areas based on the proposed physical structure plan.

5.2 The Proposed Physical Structure Planning Strategy

The physical structure of the region proposes the development of two highways passing through the central and eastern portion of the region in a north-south direction by opening up the undeveloped hinterland. A radial highway network from the three development areas of the region will connect with the proposed highway network. It is expected that these developments will serve as the main driving force to stimulate economic growth of the region. Three Sub Regional Centres namely Pulmodai, Gomarankadawala and Dehiathakandiya which are located away from the main development areas will function as main development activity nodes for their own catchment area of 15 km radius. These centres will be connected with the main growth areas and other growth centres outside the region at close proximity through the radial road network.

This structure proposes to establish the selected nodal points as service centres, to ensure good connectivity from these centres to the development areas and different parts of the province as well as between the neighbouring towns and cities specially Anuradhapura, Pollonnaruwa, Vavunia, Horawapothana, Mahiyangane, Symbalanduwa and Moneragala.

The major highways and roads network will connect the proposed development areas such as Trincomalee industrial and port related development area, Batticaloa fisheries and tourism related development area and Ampara agro based and tourism related development area and other sub regional centres of Pulmodai, Gomarankadawala and Dehiathakandiya. This will ensure that there is good access between the centres according to their location and the area of influence. The sea route connection from Olivil to Trincomalee and to other ports of the country will provide a new access route for linking with the rest of the country.

This Physical Structure Plan has restricted the use of lands considered to be environmentally sensitive for development purposes in certain areas in the western, southern and coastal areas and marine areas in the eastern part of the region. The large stretch of agricultural land along the central part of the region has been earmarked for agricultural production specially paddy, other field crops, plantations and animal husbandry. Proposed structure plan for the Eastern Province is given in Map 5-1.

5.3 The Human Settlement Structure

The Physical Structure Plan for the entire Eastern Province has been divided into six physical planning entities. The human settlement structure is also considered to be a separate planning entity. The population that would be accommodated in these planning entities would vary in terms of the development areas. Table 5.1 provides estimates of the projected population and land distribution pattern by 2030 in the Eastern Province. The Table shows that over 70% of the population would live in the three development areas where the urban centres are located. The land area covered by these development areas would be only 19% of the total land of the Eastern Province.

Urban development has been concentrated mainly along the coastal belt and this seems to be preferred due to the availability of economic opportunities and transportation facilities along the coastal belt. The three towns of Trincomalee, Batticaloa and Ampara, which are currently the district administration centers, are expected to become the main growth centers over the next 25 years. It appears that these three town centers can be developed into three distinct economic growth centers linked to other town centers in the districts, without compromising the natural growth trends observed.

Table 5-1 Land extent and population in the proposed development areas by 2030

Type of development area	Extent (Sq km)	Land Coverage (%)		Distribution of population %
Trincomalee industrial and port related development area	498	5	512	17
Batticaloa Fisheries and tourism based development area	598	6	820	28
Amparai Agriculture, industries and Tourism based development area	797	8	787	27
The Marine and Coastal Area*	498	5	60	---
Agricultural Production and rural settlement area	3587	36	812	28
Environmental Conservation and Management Area	3986	40	None	None
Total	9965	100	2,931	100

* This is included in the populations of Batticaloa, Trincomalee and Ampara development areas.

As shown in the Table 5.1, the marine and coastal area will accommodate 60,000 population, mainly fisher folks of the region, while the agricultural production and rural settlement area will account for 28% of the total population. It is proposed that the human settlement development will not be allowed within the environmental conservation and management area.

Map 5-1 Physical Structure Plan for the Eastern Province by 2030

**Map 5-2 Hierarchy of Service Centers in the Eastern Province
by 2030**

These human settlements will be supported by the network of service centres as given in Table 5.2 Proposed Hierarchies of Service Centres are shown in the Map 5-2. According to the map most of the 1st order, 2nd order and 3rd order service centres will be located in the three development areas. The other 4th order and 5th order service centers will continue to function as nodal points linking the main development areas through radial road network. These service centers will provide the required economic, social, physical and recreational facilities to the residents in order to sustain the level of the service centre.

Table 5.2 Proposed Hierarchies of Service Centres

Service Centres		Service Centres		Service Centres	
Trincomalee	1	Batticaloa	2	Ampara	2
Kantale	3	Kattankudy	3	Kalmunai	2
Mutur	3	Eravur / Chenkalady	3	Samanthurai	3
Kinniya	3	Vakarai	3	Akkarapattu	3
Pulmodai	3	Karadiyanaru	3	Thirukkovil	3
Gomarankada wala	3	Valaichenai	3	Potuvil	3
Thampalagam am	4	Kaluwanchchikkudi	3	Dehiyathakan diya	3
Padavisiripura	4	Kokkadichchola	4	Oluvil / Ninthavur	3
Thiriyaya	4	Mandur	4	Mahaoya	3
Kuchaveli	4	Siththandi	4	Padiyathalawa	4
Echchilampattu	4	Mankerni	5	Panama	4
Sampur	4	Pullumalai	5	Bakkiella	5
Irrakkandy	5	Unnichchai	5	Thottama	5
Morawewa	5			Padagode	5
Palathopur	5				
Mullipotthana	5				
Seruvila	5				

5.4 Human Settlement and Housing Development proposals

Housing development is based on the proposed human settlement strategy for the region. The Physical structure plan has categorized the human settlement strategy into the following;

- Urban settlement strategy
- Rural settlement strategy

5.4.1 Urban Settlement

Urban settlements fall within developed areas between the proposed highway and the coastal and marine zones. According to the proposed structure plan, the main urban agglomeration areas that would fall within the Eastern Province by 2030, would encompass, Trincomalee UC, Batticaloa MC, Ampara UC, Kalmunai MC, Kattankudy UC, Kantale, Muthur, Ervur/Chenkalady, Samanthurai, Kinniya, Vakarai, Akkaraipattu, Kradiyanaru, Thrukkovil, Valachanai, Potuvil, Kalwanchikudy, and Oluvil/Ninthavur. It is proposed to concentrate the population in these areas and allow the rest of the areas for food production and environmental conservation. As far as the spatial development areas are concerned, the above-mentioned urban areas are distributed as follows.

Spatial Unit	Name of the proposed urban areas	Estimated Population By 2030	Proposed Gross density (Persons per hectare)
Trincomalee Industrial and port related development area	Trincomalee UC, Kantale, Muthur, Kinniya	512,000	11
Batticaloa fisheries and tourism related development area	Kattankudy UC, Ervur/Chenkalady, Vakarai, Kradiyanaru, Valachanai, Kalwanchikudy,	820,000	14
Ampara agricultural, industrial and tourism related development area	Ampara UC, Samanthurai, Thrukkovil, Kalmunai, Akkarapattu, Potuvil, and Oluvil/Ninthavur	787,000	10

5.4.2 Rural settlements

Rural settlements will be developed in areas close to the agricultural production areas within the region. In addition five sub-regional centers are proposed to create linkages with rural settlements. These centres are Pulmodai, Gomarankadawala, Dehiyathakandiya and Mahaoya. It is expected to develop these centres as 3rd order service centres for the region. In addition settlements will be developed in other rural areas such as Irrakakandy, Unnichchai, Thottama, Morawewa, Palathopur, Mullipotana, Serwila, Bakkiella, Pullumalai, Padagoda. These areas will be developed as 5th order centres to serve the rural community. Main economic activities in these rural areas will be agriculture based.

5.4.3 General objectives

To meet the present and projected demand for housing in the Eastern Province

5.4.4 Specific Objectives

To fulfill the present demand for housing in the designated areas for human settlements in the proposed physical structure plan

To develop housing areas in the Eastern Province to accommodate projected population by 2010, 2020 and 2030.

To develop residential development in harmony with the environment

5.4.5 Housing Development proposals

In order to formulate proposals for housing development in the EP, the estimation of housing need is essential. Ideally, the housing needs should be estimated using the set of following assumptions:

The replacements to stock considered necessary i.e. new units are necessary to replace superannuated stock as well as losses owing to demolition.

The reduction of crowding in the existing stock, i.e. multiple families occupy in single housing unit and

Demand arising from net family formation i.e. demand generated by new families.

Due to the non-availability of relevant data mentioned in above assumptions, the estimation for housing needs in this plan has been carried out using general assumption of family size. Housing need

does not correspond directly to the number of families because of the extended family system, (more than one family living in one housing unit) that is prevalent in Sri Lanka. Therefore, the number of housing units needed, can be less than the number of families. Further, the actual housing demand can be different from the number of units needed due to reasons of unaffordability. However, due to the non - availability of actual data (secondary or empirical), in preparing the housing needs estimates, it was assumed that every family would need and demand a house. Current status of the housing stock is given in the Volume 1.

The average family size of the each DS divisions, which was calculated by dividing the current population by the number of families, ranges from 3.7 - 4.1 persons per family. Considering the diminishing trend of the national average family size, it was assumed that the present average family size of each DS division would not change up to 2010. Thereafter this figure was expected to increase 4.1 and 4.0 for 2020 and 2030 respectively. The estimated housing needs for 2010, 2020 and 2030 are given in the Table 5.2.

Phase 1: Recovery Phase

In this phase the main focus of the housing development programme should be the rehabilitation and resettlement of all families in their original homes. In addition 106554 housing units will have to be constructed within the province to fulfill the housing requirement by 2010. Table 5.2 gives the housing requirement by DS divisions by 2010. For this purpose 2695 ha of land would be required within the province. Land requirement by DS Divisions is given in the Table 5.3.

Phase 2: Transitional Phase

In this phase housing development would be confined to the construction of new housing units in the designated areas within the province. Total regional housing requirement in this phase would be around 130520 units in 2020. The total land requirement for construction of new housing units would be 3301 ha. Table 5.2 and 5.3 give the housing requirement and the land requirement by DS division by 2020.

Phase 2: Steady development Phase

In this phase total regional housing requirement would be around 146663 units by 2030. The total land requirement for construction of new housing units would be 3710 ha. Tables 5.2 and 5.3 give the housing requirement and the land requirement by DS division by 2030. Housing construction would be carried out in the designated areas within the province in order to integrate with the infrastructure development.

See Map 5-3

Table 5-2 Housing Need Estimates for Divisional Secretary Divisions of the Eastern Province upto 2030

District	DS Division	Number of families 2001	Housing Stock 2001	Estimated families 2010	Estimated housing need by 2010	Estimated families 2020	Estimated housing need by 2020	Estimated families 2030	Estimated housing need by 2030
Batticaloa	Eravur Pattu	16778	15197	20935	5738	26529	5594	35640	9111
	Eravur Town	8015	4998	10001	5003	13104	3103	17605	4501
	Kattankudy	10294	9303	12845	3542	15400	2555	20689	5289
	Koralai Pattu								
	Koralpattu South								
	Koralapattu Central	20978	15672	26176	10504	34881	8750	46861	11980
	Koralai Pattu North	5121	4658	6390	1732	8264	1874	11103	2838
	Koralai patthu West	6506	5986	8118	2132	10028	1910	13472	3444
	Manmunai Pattu	7838	6305	9780	3475	11310	1529	15194	3884
	Manmunai North	19201	18176	23958	5782	30553	6594	41046	10493
	Manmunai South & Eruvil pattu	14299	12047	17842	5795	21880	4038	29395	7515
	Manmunai South west	5894	5042	7354	2312	9384	2030	12607	3223
	Manmunai West	7222	6965	9011	2046	11020	2009	14805	3785
	Porativupattu	11749	8429	14660	6231	17985	3325	24162	6177
Total		133895	112778	167070	54292	210337	43267	282577	72240
Ampara	Addalaichchenai	8944	8060	10784	2724	13925	3141	16686	2761
	Akkaraipattu	8744	8089	10543	2454	13607	3064	16304	2697
	Alayadiwembu	5643	4876	6804	1928	8739	1935	10472	1732
	Ampara	9498	9363	11452	2089	14786	3335	17718	2931
	Damana	8688	9959	10475	516	13526	3051	16208	2681
	Dehiyathakandiya	14742	18639	17774	-865	24368	6594	29199	4831
	Irakkamam	3265	2853	3936	1083	4453	517	5336	883
	Kalmunai	17623	15082	21248	6166	27414	6167	32849	5435
	Karathivu	4369	3660	5268	1608	6309	1041	7560	1251
	Lahugala	2227	2023	2685	662	2953	268	3538	586
	Mahaoya	4504	4514	5430	916	7014	1584	8405	1391
	Navithanveli	4333	4237	5224	987	6745	1521	8082	1337
	Ninthavur	6172	6164	7442	1278	9602	2161	11506	1904
	Padithyathalawa	3912	3913	4717	804	6090	1374	7298	1208
	Pottuvil	7106	6677	8568	1891	11055	2487	13246	2192
	Sainthamaruthu	6009	5233	7245	2012	9348	2103	11201	1853
	Samanthurai	12113	12174	14604	2430	19904	5300	23850	3946
	Thirukkivil	7061	15362	8513	-6849	9239	726	11071	1832
	Uhana	13030	13626	15710	2084	20291	4581	24314	4023
Total		147983	154504	178420	23916	229368	50948	274841	45472
Trincomalee	Gomaragadawela	1864	1586	2214	628	2902	688	3477	575
	Kanthalai	11764	11767	13973	2206	18314	4341	21945	3631
	Kinniya	12368	12274	14690	2416	19319	4629	23149	3830
	Kuchchaveli	10797	5586	12824	7238	16768	3944	20093	3324
	Morawewa	3987	1234	4735	3501	7283	2547	8727	1444
	Muthur	13380	12595	15892	3297	20903	5012	25048	4144
	Padavisripura	2993	3011	3555	544	4660	1105	5583	924
	Seruwila	3199	3311	3800	489	4971	1171	5956	986
	Thampalagamam	10969	6610	13028	6418	18886	5858	22630	3744
	Town & Gravets	18597	21643	22088	445	29378	7289	35202	5824
Verugal	2464	1762	2927	1165	2647	-280	3171	525	
Total		92382	81379	109725	28346	146030	36305	174980	28950
PROVINCE TOTAL		374260	348661	455215	106554	585735	130520	732398	146663

Assumptions:

- The number of families assumed to be equal to the number of housing units required.
- The housing need up to 2010 has been estimated on the basis of existing family size and the current housing stock.
- The future average family size have assumed to be 4.1 and 4.0 for the years 2020 and 2030 respectively, and equally applied to all D.S. divisions.

Table 5-3 Land requirement for housing development by 2010, 2020 and 2030

District	DS Division	Housing need by 2010	Land requirement by 2010 (Ha)	Housing need by 2020	Land requirement by 2020 (Ha)	Housing need by 2030	Land requirement by 2030 (Ha)
Batticaloa	Eravur Pattu	5738	145	5594	141	9111	230
	Eravur Town	5003	127	3103	78	4501	114
	Kattankudy	3542	90	2555	65	5289	134
	Koralai Pattu						
	Koralpattu South						
	Koralapattu Central	10504	266	8705	220	11980	303
	Koralai Pattu North	1732	44	1874	47	2838	72
	Koralai patthu West	2132	54	1910	48	3444	87
	Manmunai Pattu	3475	88	1529	39	3884	98
	Manmunai North	5782	146	6594	167	10493	265
	Manmunai South & Eruvil pattu	5795	147	4038	102	7515	190
	Manmunai South west	2312	58	2030	51	3223	82
	Manmunai West	2046	52	2009	51	3785	96
	Porativupattu	6231	158	3325	84	6177	156
	Total		54292	1373	43267	1094	72240
Ampara	Addalaichchenai	2724	69	3141	79	2761	70
	Akkaraipattu	2454	62	3064	77	2697	68
	Alayadiwembu	1928	49	1935	49	1732	44
	Ampara	2089	53	3335	84	2931	74
	Damana	516	13	3051	77	2681	68
	Dehiyathakandiya	-865	-22	6594	167	4831	122
	Irakkamam	1083	27	517	13	883	22
	Kalmunai	6166	156	6167	156	5435	137
	Karathivu	1608	41	1041	26	1251	32
	Lahugala	662	17	268	7	586	15
	Mahaoya	916	23	1584	40	1391	35
	Navithanveli	987	25	1521	38	1337	34
	Ninthavur	1278	32	2161	55	1904	48
	Padithyathalawa	804	20	1374	35	1208	31
	Pottuvil	1891	48	2487	63	2192	55
	Sainthamaruthu	2012	51	2103	53	1853	47
	Samanthurai	2430	61	5300	134	3946	100
	Thirukkivil	-6849	-173	726	18	1832	46
	Uhana	2084	53	4581	116	4023	102
	Total		23916	605	50948	1289	45472
Trincomalee	Gomaragadawela	628	16	688	17	575	15
	Kanthalai	2206	56	4341	110	3631	92
	Kinniya	2416	61	4629	117	3830	97
	Kuchchaveli	7238	183	3944	100	3324	84
	Morawewa	3501	89	2547	64	1444	37
	Muthur	3297	83	5012	127	4144	105
	Padavisripura	544	14	1105	28	924	23
	Seruwila	489	12	1171	30	986	25
	Thampalagamam	6418	162	5858	148	3744	95
	Town & Gravets	445	11	7289	184	5824	147
	Verugal	1165	29	-280	-7	525	13
Total		28346	717	36305	918	28950	732
PROVINCE TOTAL		106554	2695	130520	3301	146663	3710

Map 5-3 Human settlement plan - 2030

5.5 Urban Design & land-use zoning policy

5.5.1 Objectives

It is intended that this Physical Plan would define spatial concepts for key urban centres in the Eastern Province.

The spatial concepts shall be character-based, wholistic, and three-dimensional.

The spatial concepts will guide the development of each urban centre within a **functionally efficient, environmentally sustainable and visually imageable** framework.

5.5.2 Policy principles

5.5.2.1 Socio-Economic character

Concepts for each urban centre will be derived from the key features of the Development Area to which it belongs.

Each Development Area is characterized by a general economic direction and social purpose, and each urban centre within the Development Area (or within its zone of influence) is further described by a specific socio-economic character. Spatial concepts for each urban centre are derived from the defined socio-economic character.

5.5.2.2 Inherent potential

Spatial concepts will be derived from the inherent potential of each urban centre. Potentials include key physical and environmental features, historical and heritage features, existing patterns of use and development, and intrinsic features of the social fabric. Where an urban centre contains an existing downtown core, the significant potential of the downtown core as a living, sustainable, inner city district will be developed.

5.5.2.3 Defined Size & dense growth

Urban centres shall be of a defined size and extent, and spatial concepts shall provide for dense growth and other measures to deter urban or suburban sprawl.

5.5.2.4 Incremental growth

Spatial concepts shall allow the urban centres maximum freedom for incremental growth in keeping with the evolving economic capacity of its residents.

5.5.2.5 Spatial & three-dimensional character

Spatial concepts shall define a specific spatial and three-dimensional character for each urban centre. Specific attention will be paid to the creation of a spatial hierarchy and achieving visual legibility: Axial and other linkages shall define visual association between important spaces.

5.5.2.6 Urban Components

Urban centres shall contain defined points of entry, a town centre, a major public space, and secondary public spaces. Specific attention shall be paid to waterfronts- both sea & lagoon.

5.5.2.7 Neighbourhood character & streetscape

Spatial concepts shall promote the creation of neighbourhood and streetscape character in each zone/sub-zone and shall encourage visual continuity and harmonized patterns of growth.

5.5.2.8 Functional mix & density-based zoning

In keeping with current international and national trends, a functional mix will be promoted wherever possible. The functional

mix shall however define a dominant activity for each zone. Zoning shall be density-based: established primarily with the intent of achieving densities specific to locational and functional characteristics within different parts of urban centres. Wherever necessary, special zones shall be defined.

5.5.2.9 Residential cities

Housing and residences will be promoted in every zone (except where excluded due to environmental or security concerns) in order to encourage living and vibrant cities.

5.5.2.10 Graded traffic, highway by-passes, pedestrian zones

Spatial concepts shall promote the grading of traffic within urban centres, with specific emphasis on Highway bypasses / outer roads which encourage through and fast traffic to by-pass urban centres. Low-speed traffic and pedestrian streets will be encouraged within the downtown core. Public transport by low-emission vehicles of scales suited to the urban environment will be promoted in the downtown core, while private vehicles will be discouraged within this zone. Cycle and pedestrian lanes shall be promoted wherever possible.

5.5.2.11 Landscaping

Spatial concepts shall promote a landscaping plan for each urban centre, including the creation of parks and open spaces, waterfronts (beaches, marinas, piers), and street landscaping, including paving of cycle and pedestrian lanes.

5.5.3 Scope

Conceptual Urban Plans, which include Urban Design-Land Use Zoning Guidelines, are defined for selected service centres listed below. However, the Principles defined above are applicable to all service centres listed in the Hierarchy of Service Centres.

Trincomalee industrial and port-related development area:

- Trincomalee
- Kantale
- Mutur
- Kinniya
- Pulmodai
- Thampalagamam

Batticaloa Fisheries and tourism based development area:

- Batticaloa
- Kattankudy
- Eravur - Chenkalady
- Valachchenai
- Kaluwanchikudi

Amparai agricultural, industrial and tourism related development area:

- Ampara
- Kalmunai
- Sammanthurai
- Akkarapattu, Thirukkivil, Potuvil, Oluvil-Ninthavur

Conceptual urban plans are given in Maps 5.4 – 5.21

5.5.4 Implementation Policy

These Urban Design-Land Use Zoning Guidelines shall set down specific concepts for each of the above town centres. These

Guidelines are to be used in conjunction with the Planning and Building Regulations in the following manner:

1. The Urban Design-Land Use Zoning Guidelines shall supercede the Planning and Building Regulations.
2. Where the Urban Design-Land Use Zoning Guidelines are silent on any aspect, the general requirements of the Planning and Building Regulations shall apply.
3. Implementing authorities are advised to refer to the Urban Design-Land Use Zoning Guidelines as a general guide to the intent of the regulations, and therefore as a key to the interpretation of regulations.

5.5.5 Conceptual Urban Plans:

5.5.5.1 Conceptual Urban Plan: Trincomalee

The principal maritime metropolis of the eastern province.

The diverse potential of each of Trincomalee's seafronts will be exploited to create a series of seafronts of varied purpose and character: a public / recreational beach, a commercial harbour and marina, a residential park-beach, a local fisheries harbour, an industrial harbour, a military harbour, a heritage seafront and an urban forest seafront. See Map 5-4

The main existing public area will be developed as a civic hub, which is an urban focal point for the city, while the existing mode of entry to the town will be developed to define a distinct city entrance. The downtown core will form the contiguous urban fabric which creates connectivity between each of the series of seafronts. The significant potential of the downtown core as a living, sustainable, inner city district will be developed as a dense mixed-use zone, including a specific pedestrianised commercial district.

The conceptual three dimension graphical visuals of the Trincomalee urban area by 2030 are given in Figure 5.1 – 5.4.

5.5.5.2 Conceptual Urban Plan: Kantale

A service centre for the agricultural hinterland.

The highway by-passes the town centre and the growth of the town will be diverted away from the main Highway. The town is organized along a linear park which culminates in a main public space. See Map 5-5

5.5.5.3 Conceptual Urban Plan: Muttur

A harbour town servicing the main industrial Port.

The main avenue is the principal spine of urban activity, which culminates in a public park and promenade. A public pier, a landmark building, and a formal gate-way to the harbour are principal urban elements. See Map 5-6

5.5.5.4 Conceptual Urban Plan: Kinniya

A harbour town servicing the main industrial Port.

Twin avenues are arranged on either side of a central canal which runs through the town, and culminates in public spaces at each end. Kinniya will be linked to Muttur by a new bridge. See Map 5-7

5.5.5.5 Conceptual Urban Plan: Pulmodai

A medium density town, incorporating an industrial zone for the existing ilmenite processing industry. The town centre is arranged around a central public park. See Map 5-8

5.5.5.6 Conceptual Urban Plan: Thampalagamam

An industrial town, including a dedicated industrial zone.

A highway by-pass diverts through-traffic from the town centre. The by-pass includes an over-pass to allow extension of the railway into the industrial zone. See Map 5-9

5.5.5.7 Conceptual Urban Plan: Batticaloa

The administrative centre of the Batticaloa district.

Developed as a Lagoon town, with an emphasis on tourism. The central island is conserved and re-used for heritage-based tourism. The waterfronts are developed for tourism and public activity, and linked by ferries. See Map 5-10

The conceptual three dimension graphical visuals of the Batticaloa urban area by 2030 are given in Figure 5.7 – 5.12.

5.5.5.8 Conceptual Urban Plan: Kattankudy

A third order service centre. The town is organized around a central node. A main feature of the town is a beach park, with axial visual links to the main node. See Map 5-11

5.5.5.9 Conceptual Urban Plan: Eravur – Chenkalady

A third order service centre. The focal point of the town is the main street linking the main node to the railway station on one side and a new ferry point on the other. A highway bypass diverts through traffic from the town centre. See Map 5-12

5.5.5.10 Conceptual Urban Plan: Valachchenai

The principal focus of activity is the fisheries harbour which forms an arc at its northern face. The highway by-passes the town centre and the growth of the town will be diverted away from the main Highway. The town is organized along the arc and the main spine, linking the harbour, a public park, and a node which includes the railway station. See Map 5-13

5.5.5.11 Conceptual Urban Plan: Kaluwanchikudi

A linear town comprising a series of nodes fronted by a linear public park along the lagoon. A new bridge connects the town to other smaller centres in the interior. See Map 5-14

5.5.5.12 Conceptual Urban Plan: Ampara

The main administrative centre of the Ampara district, as well as the principal service centre for the agricultural production area. The town is organized along the main street which culminates in a node and public space facing the lake. A special agro-service zone is identified with direct links to both highways leading to the town. The lake front is identified for tourism activity. See Map 5-15

The conceptual three dimension graphical visuals of the Ampara urban area by 2030 are given in Figure 5.13 – 5.19.

5.5.5.13 Conceptual Urban Plan: Kalmunai

The existing dense strip development is modified by the introduction of beach parks and nodes. The beach parks connect the town centre to the beach, while nodes will be created where highway connections occur. See Map 5-16

5.5.5.14 Conceptual Urban Plan: Sammanthurai

A high-density nodal service centre. The outer highway is dedicated to through traffic while the city centre grows along cross-roads generated at a main node. See Map 5-17

5.5.5.15 Conceptual Urban Plan: Akkarapattu

A high-density nodal service centre. The town is organized along a spine linking the main node to a secondary node which contains institutional functions arranged around a central public space. See Map 5-18

5.5.5.16 Conceptual Urban Plan Thirukkovil

A high-density nodal service centre. The town is organized along a spine generated from a main node containing a central public space. A secondary node serves the southern low-medium density zone. See Map 5-19

5.5.5.17 Conceptual Urban Plan: Potuvil

A medium density town with an emphasis on eco-tourism. A main node, which includes a large public park, is located at the entrance to the town, and generates the spine of the town. Water fronts are dedicated to eco-tourism and public activity, and includes a beach-park. See Map 5-20

5.5.5.18 Conceptual Urban Plan Oluvil-Ninthavur

A medium density town servicing the growth of the University and the harbour. The town is organized along a central spine which culminates in a University node and a Harbour node. See Map 5-21

5.5.6 Implementation policy

These Urban Design-Land Use Zoning Guidelines shall set down specific concepts for each of the above town centers. These Guidelines are to be used in conjunction with the Planning and Building Regulations in the following manner:

The Urban Design-Land Use Zoning Guidelines shall supercede the Planning and Building Regulations;

Where the Urban Design-Land Use Zoning Guidelines are silent on any aspect, the general requirements of the Planning and Building Regulations shall apply;

Implementing authorities are advised to refer to the Urban Design-Land Use Zoning Guidelines as a general guide to the intent of the regulations, and therefore as a key to the interpretation of regulations.

Map 5-4 Conceptual Urban Plan for Trincomalee

t23 copy- VIEW TOWARDS NORTH

t24 - VIEW TOWARDS SEA FROM SOUTH-WEST

t20 - SOUTHERN VIEW

t9 copy- TRINCOMALEE SKYLINE SEEN FROM A MARINA

t7 - SOUTH-EAST VIEW

t5 - VIEW TOWARDS WEST FROM OCEAN

2 1copy - VIEW TOWARDS WEST

Map 5-5 Conceptual Urban Plan for Kantalai

Map 5-6 Conceptual Urban Plan for Mutur

Map 5-7 Conceptual Urban Plan for Kinniya

Map 5-8 Conceptual Urban Plan: Pulmodai

Map 5-9 Conceptual Urban Plan for Thampalagamam

Map 5-10 Conceptual Urban Plan for Batticaloa

S1 - VIEW TOWARDS LAGOON BEYOND INSTITUTIONAL
ZONE & S2 - PLAN VIEW OF BATTICLOA

S3 - VIEW TOWARDS THE CITY BEYOND THE MAIN
BRIDGE & S6 - AERIAL VIEW 1

S7 - VIEW INTO THE CITY FROM SOUTHERN SUBURBS &
S91- VIEW TO THE SEA FROM LAGOON (HERITAGE
ZONE TO THE LEFT)

Map 5-11 Conceptual Urban Plan: Kattankudy

Map 5-12 Conceptual Urban Plan for Eravur / Chenkalady

Map 5-13 Conceptual Urban Plan: Valachchenai

Map 5-14 Conceptual Urban Plan: Kaluwanchikudi

Map 5-15 Conceptual Urban Plan for Ampara

W1 - TOP VIEW & W3 - VIEW ABOVE THE LAKE
TOWARDS EAST

W4 - LOOKING TOWARDS EAST FROM HIGH DENSITY ZONE & W5 - LOOKING TOWARDS THE MAIN STREET & PUBLIC SPACE FACING THE LAKE.

W7 - BIRD'S EYEVIEW OF AMPARA CITY & W8 -
LOOKING TOWARDS SUNRISE IN THE EAST FROM
SOUTHWEST

Map 5-16 Conceptual Urban Plan for Kalmunai

Map 5-17 Conceptual Urban Plan for Sammanthurai

Map 5-18 Conceptual Urban Plan for Akkaraipattu

Map 5-19 Conceptual Urban Plan for Thirukkovil

Map 5-20 Conceptual Urban Plan for Pothuvil

Map 5-21 Conceptual Urban Plan Oluvil-Ninthavur

6 CHAPTER 6: ENVIRONMENTAL MANAGEMENT IN THE EASTERN PROVINCE

6.1 Introduction

Environment makes up a vital and important component of any physical plan. Environmental management is a multi disciplinary and inter-dependant topic that has to be dealt with according to the type of issue or problem that may arise. Though it is not possible to identify or pin point the impacts or the importance of every event and location, the guidelines set out can ensure that environmental hazards are avoided/ mitigated/ protected, at every stage. Environmental issues can be handled in many ways, depending on the type, location and the importance of the issues concerned. Protection, prevention, mitigation, development, regulations, information and human resource development are some of the means of managing the environment.

The eastern province is abundant in natural resources and beauty, which may be harvested in a sustainable manner if we reduce the threats (mainly of pollution and misuse) and enhance the opportunities (value additions).

6.2 Environmental sensitive areas within the Eastern Province

The nature and the various types of natural resources available in the Eastern Province are described in the Interim report. The coast and coastal ecosystem resources predominate in the province. Pigeon Island near Trincomalee has been declared as a Marine National Park. Kaudulla and Minneriya National parks, were both declared as protected areas more recently, thus emphasizing the link to the forests of the Eastern province and enhancing the overall importance of these in the conservation arena. Since wildlife do not recognize administrative boundaries, the protection of the associated forest as a continuation of the existing protected areas becomes a high priority.

At present there are a total of 14 protected areas in the Eastern Province. More ecologically sensitive areas could be declared as protected areas, provided that there is adequate information on the nature and type of resources that need to be protected. Presently, the only recourse is to use broad guidelines for declaring such protected areas.

Sathurukondan wetlands, 4 km north of Batticaloa, has been studied by many authors and recommended for conservation. The GA of Batticaloa declared it as a local reservation in 1992, within the ambit of his authority. However formal procedures are needed to declare this as a sanctuary as it is known to be an important site for birds. The EPCCDP also had highlighted its value. Many of the coastal water bodies have been studied under the EPCCDP project and they have highlighted areas of high biodiversity, on preliminary investigation.

The high semi evergreen monsoon forests are limited in the province and are confined to the landside borders of the district and may be considered for conservation measures. The existing riverine vegetation needs to be protected, as vegetation associated with many rivers has been destroyed. An elephant corridor, which was proposed three decades ago, is an urgent need in order to allow elephants from the Ampara/Badulla areas in the south to move to the Batticaloa/Pollonnaruwa region. This may be more feasible now, since many lands previously cultivated in this corridor have been abandoned for over twenty years, due to the conflict.

A part of the province falls within the control of the Mahaweli Authority, which is mainly involved in agricultural development through irrigation. The high priority given for the establishment of Mahaweli villages, was probably the reason for not establishing the corridors earlier. However it is important that in any future land use planning exercise, consideration should be given to the needs of all uses, including agriculture, environment, wildlife and infrastructure developments, as well as the requirements of the Mahaweli Authority.

6.2.1 The Coastal Zone

The entire Eastern Coast has to be protected (managed to avoid degeneration of value). Most of the cities too are in the coast. The only activities recommended are planned tourism in limited zoned areas and coastal production (including shrimp farms) in defined areas. Zoning would be done in due course. Additional infrastructure to assist the fishing industry (rest house, ice plants, mini harbors etc have been suggested in the EPCCDP project which is under implementation). One new project would be the processing of Mineral sands in our country itself rather than selling the sand for processing abroad.

Eastern Province is a coastal province with all three districts being in the coast. It stretches from Kokkilai in the north to Kumbukkan oya in the south. It holds about 28 % of the coast-line with 420 km of coast (210+100+110) of the total 1530 km. They share a significant variety of coastal habitats of the country.

One needs to be cautious when implementing projects in this zone, as data has not been revised since 1986, and more recent data are not available. Recent inventories have not estimated/ surveyed the resources in the North Eastern Province. For example, estimates based on satellite imagery have shown that Batticaloa had lost more than 10% of the mangroves over the past two decades (Forest Department). The conflict, which began in 1983 has had a tremendous impact on the entire eastern coast and proper quantitative estimates are not available. However a recent NARA study had shown that the corals of Pigeon island had not bleached like the others in the country (e.g. Hikkaduwa).

6.2.2 Riparian and catchment areas

Rich vegetation found in these areas are of great importance for the conservation of water, to avoid flash floods, prevent erosion, as well as provide water over long periods etc. Such vegetation needs to be conserved. The estuaries of river systems have much of the mangroves and special ecosystems especially near Gangai in Mahaweli, near Panama for Maha Oya and near Kumana for Kumbukkan oya.

6.2.3 Special ecosystems

Special eco systems like the Aralu Bulu Nelli Kele of the Ampara district, Villus of the Mahaweli flood plains, and the Lakes and wetlands (Sathurukondan, Thandiyadi, Ullekelle), which are important for bird life, have also been identified for preservation in the EPCCDP project. Ampara district is the only one in the North East, which has high elevation rocky out crops and vegetation and ecosystems in such areas should be given special consideration. For example, the 'Gal Siyambala' is chopped for the collection of fruit, and is becoming rare in these regions.

6.3 Objectives

The prime objective of the environmental management plan is to have unaltered natural landscape and protect natural resources of the region through implementation of environmentally sound regional physical plan. The specific objectives are,

To encourage sustainable use of natural resources especially forestry and coastal resources

To safeguard the fragile ecosystems such as lagoon, wetlands, high semi evergreen monsoonal forests of the region

To assure minimal environmental impacts are experienced during the implementation of the plan

To promote sustainable urban environmental management in the development areas

6.4 Environmental conservation and management planning strategy

It is important that we ensure that adequate safeguards are in place to ensure that the environmental concerns are addressed during development. The current legislations related to the environment protection are just adequate to ensure that, provided the laws can be enforced effectively. The list of the legislations related to environment and details of some important ones are given below.

- National legislations of significance to this project are the following:
- Constitution of the Democratic Socialist republic of Sri Lanka
- National Environmental Act 47 of 80 and its amended act 56 of 1988
- Mines and mineral act 33 of 1992
- Coast Conservation Act No 57 of 1981 as amended by act no 4 of 1996
- Fauna and Flora ordinance as amended by act no 49 of 1993
- Forestry Ordinance
- Pradeshya Sabhas Act
- Urban Development Authority Act 41 of 1978

Article 27(14) of the constitution states that it is the duty of the state “to protect preserve and improve the environment for the benefit of the community”. Article 28 (f) makes it a fundamental duty of every person “to protect nature and conserve its riches”

In order to facilitate Part IV C of the National Environmental Act (NEA) No. 47, of 1980, the Gazette Extraordinary No. 772/22 of 24th June 1993 as amended by the Gazette Extraordinary No. 859/14 of 23rd February 1995 indicates a list of legally designated environmentally sensitive areas, which cannot be used for any development purpose without the approval of the authorities responsible for the enforcement of the NEA. The study takes the above legal definition to identify the environmentally sensitive areas in the Trincomalee district.

Accordingly, the environmentally sensitive areas are as follows;

- i Within 100m from the boundaries of or within any area declared under;
 - The National Heritage Wilderness Act No. 3 of 1988
 - The Forest Ordinance (Chapter 451)

whether or not such areas are wholly or partly within the Coastal Zone as defined in the Coast Conservation Act, No. 57 of 1981.
- ii Within the following areas whether or not the areas are wholly or partly within the Coastal Zone:
 - Any erodable area declared under the Soil Conservation Act (Chapter 450)
 - Any Flood Area declared under the Flood Protection Ordinance (Chapter 449) and any flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act, No. 15 of 1968 as amended by Act, No. 52 of 1982.
 - Up to 60 meters from a bank of a public stream as defined in the Crown Land Ordinance (Chapter 454) and having a width of more than 25 meters at any point of its course.

- Any reservation beyond the full supply level of a reservoir¹.
- Any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).
- Any area declared under the Botanic Gardens Ordinance (Chapter 446).
- Within 100 meters from the boundaries of, or within, any area declared as a Sanctuary under the Fauna and Flora Protection Ordinance (Chapter 469).
- Within 100 meters from the high flood level contour of, or within, a public lake as defined in the Crown Lands Ordinance (Chapter 454) including those declared under section 71 of the said Ordinance.

Beside the above-mentioned legally stipulated environmentally sensitive areas, there are other areas that need to be conserved in the Eastern region. Any development activities in these areas need to be planned with a proper environmental management plan.

In order to achieve above objectives, environmental management plan proposes following activities in line with the development of the physical plan. Map 6-1 indicates the future landscape of the Eastern Province based on the environmental strategy.

Zonation of areas into environmentally sensitive and developmental areas.

All the environmentally sensitive areas will be demarcated according to the level of sensitivity. (Viz. high, moderate or low). In highly environmentally sensitive areas such as fragile ecosystems, no development would be allowed. In moderately sensitive areas such as forests and coastal ecosystems, limited development activities (eco tourism) that are less harmful to the environment would be allowed. In less sensitive areas such as catchment and riparian areas, development activities would be required to abide by the legal requirements.

Preparation and implementation of Special Area Management (SAM) Plans.

Plans for vulnerable ecosystems will be prepared as an integral part of the implementation plan. Since coastal zone of the province has been identified as more prone to environmental degradation due to rapid urbanization, a SAM plan would be developed for this area. .

Preparation of an Urban Environmental Management Plan

An urban environmental management plan will be prepared for the developmental areas identified in the physical plan. This will consist of solid waste management plan and urban forestry program.

¹ “reservoir” means an expanse of water resulting from man made construction across a river or a stream to store or regulate water. Its “environs” will include that area extending up to a distance of 100 meters from full supply level of the reservoir inclusive of all islands falling within the reservoir.

Map 6-1 Environmental Management Plan 2030

6.5 Environment Conservation and Management Plan

It is essential that we anticipate the potential impacts of any development phase and prepare plans to avoid, mitigate the impacts as far as possible. Possible impacts include

6.5.1 *Clearing of land for roads and buildings, changing of landscape*

Clearing of forests could cause a variety of impacts viz. loss of biodiversity (bird and large animal life in particular), increased soil erosion, increasing the likelihood of further felling of trees or poaching etc.

However these are addressed by the National Environment Act (NEA) and the Forestry and Flora and Fauna act. Any major project that needs to be under taken are subject to Environmental Impact Assessment / Initial environmental Examination (EIA/IEE) as appropriate under the NEA. It is during this phase that detailed studies are done to examine the potential impacts and alternatives if any. It is important to ensure that the administrative/management machinery required for implementing the plan is put in place during the planning stage. It is also important the apparatus for training officials and managers in appropriate methodology of EIA/IEE, should be included in the plan. Attitudinal changes brought about by appropriate training of stakeholders, officials and informed participants, would make them better equipped for conservation. Improved awareness of the local environment by stakeholders would also assist in achieving the overall goal. As a requirement of the act, the EIA/IEE reports are made available for public comments prior to approval. It is therefore important that the public is made aware of the issues in order for them to comment on such cases.

6.5.2 *Extraction of forest and wildlife resources for utility purpose*

The Forest Ordinance and the Flora and Fauna act adequately cover these areas. It is also stated that any activity within one mile from the periphery of any declared National Park or Sanctuary should be undertaken only with the permission of the Department of Wildlife Conservation and such activity should not be in conflict with the aims of conservation.

6.5.3 *Mining/Extraction of sand, gravel, clay for construction industry*

Over extraction of sand, gravel, or clay for the construction industry is a major environmental issue at present. Over extraction of sand could cause the collapse of riverbanks, saltwater intrusion, deepening of riverbeds etc. Mining of clay and gravel could create large craters in the ground, causing the land to become unproductive and also create a potential breeding spot for mosquitoes, a health risk.

The impacts are addressed by the Mines and Mineral act No 33 of 1992, which is administered by the Geological Survey and Mines Bureau (GSMB), which controls the mining process by a licensing system. EIAs may become necessary for large-scale operations.

It is important that a system for implementation be formulated to address these issues.

6.5.4 *Extraction of granite/quarry for roads and buildings*

There are many environmental hazards caused by these activities. Such activities are also controlled by the GSMB, and are subject to licensing. However the industry would require a initial IEE/EIA as appropriate and also an Environmental Protection License (EPL) for operation.

6.5.5 *Improper solid waste disposal*

Solid waste disposal is another serious problem encountered in urbanization and development. This is addressed later in the report. However the Urban / Municipal Council / Pradeshya Sabha are responsible for this function.

6.5.6 *Increased pollution*

Environmental pollution may be categorized into air, water, noise, coastal, marine and environmental pollution in general. Some of the measures taken to reduce above pollution include environmental pollution licensing, payment according to the quantity of pollutants discharged into the environment (Polluter Pays principle), legal enforcement, etc. These measures are handled under the NEA.

6.5.7 *Sanitation and health risks associated with lack of proper drinking water, sanitary facilities.*

Sanitation and health risks caused lack of sanitation or drinking water may be directly or indirectly resulting from various types of pollution mentioned in para. 6.5.6 above. The same agencies responsible for the controlling pollution mentioned in the earlier paragraph would be responsible for safeguarding the population from these hazards as well.

6.6 Environment Management Framework for the Eastern Province

The prime tasks to be undertaken or addressed in the formulation of an environmental framework for the region are the preservation of the pristine environment, including forest cover, wetlands, coast with the exception of minerals and dunes. In the case where the environment has already deteriorated, the prevention of the further deterioration of the natural environment, or the rehabilitation of degraded environment are the two tasks to be undertaken by the environmental manager.

In the Eastern Province, about 40% of the land is under natural vegetation cover, ranging from good tropical mixed evergreen forest to thorn scrublands. The country's natural forest cover has reduced to 24% and almost the entirety of the forest cover is declared as protected areas. The largest extent of non-protected natural forest is found in the North East. Therefore it is important that the resource is managed properly, for the prosperity of the region and for the country as a whole. Good management is essential, if the needs of the population in terms of products of natural resources (e.g. timber, sand, clay etc) are to be met without compromising the sustainability of the environment.

The following projects are recommended in order to meet the above criteria. These projects have incorporated the wildlife component as they are an integral part of natural forest resources and environmental management.

- Forest Management Programme for the East (FOME)
- Wetland and Coastal Habitat Management for the East (WECOME)
- Renewable Energy Projects of the East (REPE)
- Urban Environment Management Project for the East (UREMPE)
- Mineral Resources Development of the East (MIRE)

6.7 Proposals and Action projects

The environment in general has deteriorated considerably over the past two decades of conflict in this region either due to deliberate action or inadvertently. Rehabilitation of these natural resources will form an integral part of the overall plan for the region, which would also include some pro-active measures to enhance the environment of the future.

6.7.1 Forest Management Project

Objectives	Activities	Output	Sites
Conservation of existing natural forests	Mapping, surveying of forest areas, identification of good forest and unproductive shrub land demarcation of existing protected areas	The protected areas identified and demarcated would be used for further utilization and management e.g tourism, biodiversity conservation etc. New areas would be identified for conservation or management. Marginal forests would be identified for alternate use e.g firewood forest and plantation etc.	New sites: Sathurukondan Rugam
Reforestation/ Afforestation of scrubland, wastelands	Reforestation of destroyed forest with natural forest / plantation	Increase in forest cover, biodiversity etc. Reduction in soil erosion.	Kalmunai-Pottuvil Valaichenai-Welikande Habarana-kantale Trinco-Pudavaikattu
	Afforestation of identified areas of small patches of shrub forest less than 10 ha in extent	Wood and timber production to meet the future demand on firewood, timber etc.	Karadiyan aru, Tirukovil, Kuchaweli
	Buffer zone/ boundary between forest and agriculture to be forested with plantations		Around most protected area demarcated
	Mini dendro power plants	Potential for development of dendro forestry which is a clean energy as the emission is balanced by the growth of trees	Many marginalized forested area, Karadiyan aru, tirukovil, Kuchaweli
Develop a Nursery Bank	Nursery of indigenous and exotic species for plantation, firewood, road side, urban forests in each district	Seedlings for various projects available; jobs for rural families in the district	All districts, rural areas and cities
Promote Wildlife habitat Conservation	Study migration pattern of elephants and identify corridors to link the forests in the North east	Development of corridors; linking of fragmented forests; increased biodiversity and wildlife habitats	Mahaoya, Punani, area; these corridors were identified by DWC before in principle

6.7.2 Wetland and Coastal Habitats

Objective	Activities	Output	Sites
Coastal zone protection	Demarcate the set back distances and implement control	Demarcation of set back; awareness to stakeholders	
	Restoration and plantation of cashew, coconut, casurina in the costal belt	Stabilized coast; wind protection Economic returns increased for coastal communities	Vakarai, mankerni, most areas of eastern coast at least 20,000 hecatres
	Restoration of mangrove vegetation	Biodiversity conservation, soil protection, flood prevention etc. At least 100 km linear, 1000 hectares damaged	Many areas around the lagoons in all districts; Batticaloa lagoon, Vakarai lagoon, Periya kulum, Trinco, Uppuweli, Panama etc.
Riverine protection	Lagoon and riverbanks are to be studied and the reservations to be planted with appropriate species	Well developed riverine vegetation and lagoon shore vegetation; better water flow in rivers; less flooding damages	At lest 1000 km linear planting may be necessary, most riverine forests are damaged
Development of sustainable Aquaculture	Demarcate appropriate land for aquaculture Financial and technical assistance for aquaculture Awareness and people participation in controls	More aquaculture providing financial benefits to the people Participatory conservation of resources	More than 3000 hectares are available in the province for this purpose

6.7.3 Renewable Energy Projects

Identify explore renewable energy technology in the east including dendro, wind, solar, wave etc.

Develop wind profile data and other information for planning these projects

Use of waste materials foe energy production is also an option

6.7.4 Mineral Resources

Objective	Activities	Output	Sites
Management plan for the mineral resources in the east	Study of mineral resources, an inventory, including the demand	Supply, demand data made available to plan management	
	Develop efficient industries of bricks, tiles etc	More environmental friendly bricks and tiles; more income for rural people	
	Develop industry to process mineral sand	Value addition; more income to community; Employment opportunity	Akkaraipattu, Veppavettuvan(karadiyan aru), Vakarai, Kuchaweli, Kantale
	Prepare plans for off shore sand mining	Sand available for rehabilitation and reconstruction with limited impacts on environment	Pulmoddai, tirukovil, Site to be investigated

6.7.5 Urban environment management

Objectives	Activities	Output	Sites
10% open space of developable area to be maintained in the 1 st and 2 nd order service centers	Road side planting of trees Urban parks Public squares Play grounds	Increased tree cover Clean air Aesthetically superior neighbourhood	
Increased biodiversity/ eco tourist centers	Botanical gardens, development Whale watching and other nature centers to be planned and sited	Increased biodiversity conservation Increased tourism, awareness More economical benefits to community Job opportunities	Batticaloa, Trincomalee, Akkaraipattui / one or two only. More parks to be developed in others Trincomalee
Waste management in a sustainable manner	Construction of sewerage systems in 1 st order cities Waste treatment plants in 1 st order and one 2 nd order city	Health improvement Pollution of ground water reduced Aesthetics' improved	Trincomalee, Batticaloa
Increasing the technical capacity	Develop technical services in the cities Develop University townships, integrated research development	More access to information Public participation in programmes Centers of excellence developed for further development and sustainable management	Main cities centered around the Universities/campuses
Pro active development	Development of Organic Farms	Healthy products on the market Less stress on the environment Reduction in pesticides and fertiliser usage	Demonstration, Pullumalai, Kaluthawalai, Kuchaweli, Sammanthurai, Pottuvil

6.7.6 Capacity building of staff/ stakeholders to handle environmental issues

For reasons mentioned in the earlier paragraphs, measures to increase the capacity of stakeholders (government officers, NGOs, public etc.) would be of importance in the management of the environment. It would not be possible to attempt this in the short-term or at the time it is required, because training and capacity building are by nature a time consuming process. Thus action must be taken to initiate capacity building activities at the start of the plan or programme.

6.7.7 Awareness programmes to stakeholders/public and staff for better results

Awareness programmes for public and stakeholders are essential to gain their support and confidence in environmental activities. This too is best done as a routine activity but over a longer period rather than as a short-term measure.

6.7.8 Eastern Province Forestry Development Program

Recommendations for the restoration and development of the forestry and wildlife sector including costs were given in the ERRP II report. It principally deals with the restoration of the protected areas and forest plantations and development of plantations in all districts. Although the general locations of the project have been identified, the specific sites for forest plantations must be undertaken more carefully at the location itself. Full surveys have been recommended for the districts for effective results. Although most of the recommendations of the ERRP have been accepted, they have not been implemented. These recommendations are still valid, perhaps more than in 1995, and therefore this report suggests that the recommendations of the ERRP II be followed closely.

6.7.9 Protection of all forests/natural vegetation

Only 22% of natural forest cover was still intact in the country in 1992. This level is too low when compared to other countries of the region and therefore it may be useful to protect all the natural forests in the province, which has a large proportion of natural forests, in order to at least maintain this level of natural forests in the country. The forests should be released for other purposes strictly on the basis of the guidelines and on the basis of an EIA.

The following priority order should be followed in terms of ecosystems, Wetlands > Dry deciduous forest > Monsoon forest. These actions go beyond those prescribed by law.

Small patches of forest of less than 10 hectares in extent, are to be given less priority unless it is proven to have specific rare and important biodiversity.

Isolated patches of forests should receive less priority than the extensions of large reserves or forests. Corridors should be given maximum priority as it enlarges the size of the protected area beyond the physical size itself, in terms of its biological importance. The entire forest linked to forest/wildlife reservations should be protected.

6.7.10 Restoration of Forest and wildlife reserves

The province has 17 protected areas and many other forest reserves whose exact status is not known. There was little access to these areas for security reasons. Some of the areas have been restored by the DWLC recently viz. Kumana, Yala East national park. Action must be taken to restore the reserve status of all forests, whose status is not clear at present.

6.7.11 Restoration of Plantations and new plantations

The records of most old forest plantations are inaccurate. The satellite images show the sprouting trees as tree vegetation, which is far from reality. The Teak plantation close to Punanai, along the

Pollonnaruwa-Batticaloa road is practically non-existent though it is recorded as a Teak plantation. Therefore the question of restoration does not arise but rather the question whether new plantations are necessary.

It is recommended that 500 hectares of forest plantations be established per district per year, giving priority to areas of previous plantations and marginal lands found in the district. It is also proposed to establish 20 hectares of fast growing firewood plantations in each district every year.

One of the areas that was not taken up in 1995, are the cleared forests on either side of the road from Akkaraipattu to Kuchaweli, which would be around 2000 hectares in total. It is recommended that these areas be replanted with forest plantations.

6.7.12 Riverbank and lake shore vegetation

It is recommended to establish plantations in areas where vegetation is not found up to 50 m distance from the river or the high tide mark of any lake. Tree vegetations are recommended to improve the environment, biodiversity.

6.7.13 Mangrove vegetation

The fringes of lagoons have been stripped of its mangrove vegetation, and should be replanted with mangroves to improve the environment. It is recommended to establish at least 10 hectares equivalent of mangroves per district per year.

6.7.14 Seedling Bank – Nurseries

The restoration/replanting/new plantations require planting material on a large scale. It would be necessary to establish large nurseries to meet the demand for planting material. If possible these nurseries should be established close to the proposed plantations and perhaps be located in each district, in order to reduce transport costs and damage to planting material, when transporting over long distances.

Recommended species which are already used are,

- Teak
- Neem
- Halmilla / Savandal
- Eucalyptus spp
- Acacia sp.
- Casuarina

Although there is limited knowledge on the characteristics and performance of local varieties, these varieties should also be promoted as they are more suited to local conditions. Potential local species include the following; Syzigium cumin (Naval, Dan), Alseodaphne (ranai, kolon), Cassia fistula (kondrai, ehela) etc. Shade trees such as Samanea saman (nila vakai, mara), Albizzia sp. (sooriya mara, vellai vakai) etc. may be used for road side planting. Species such as Terminalia arjuna (Kumbuk, marutham), Diospyros sp. (panichai), Maduca longifolia (mee, Iluppai), Bamboo etc. are recommended for the planting in riverine areas and shoreline of lakes. The nurseries should be established at least a year prior to the planting programme.

6.7.15 Long term projects

Long-term projects include the establishment of a botanical gardens in the North East or the Dry zone in the country, for ex-situ conservation and education purpose. The possibility of establishing a zoological gardens and a wild life corridor in the province, should be examined. This however would require more detailed studies.

7 CHAPTER 7 : ECONOMIC DEVELOPMENT PLAN

7.1 Introduction

The region is well endowed with both natural and economic resources needed for economic development. Currently, the regional economy is largely dependent on primary agricultural products, mainly paddy, fisheries and livestock. The technology adopted is still primitive and subsistence oriented. The productivity is low, due to underutilization of resources and inefficient production. There is considerable poverty in the province, in some districts as much as 50 % of the population being affected. These and other causes have resulted in lower living standards, inequality of income and unbalanced economic growth among the sectors. The Eastern province is categorized as an area of regional disparity, where considerable divestment has taken place over the last two decades due to the ethnic conflict. The Eastern province can be considered as one of most depressed in terms of economic development. Nevertheless, its resources base is comparatively high compared with the rest of the provinces in the country. The neglect of these potential resources has been detrimental to development. Thus there is an urgent need to lift the Eastern province from this economic and social stagnation, in order to bring redress to the suffering population of the province. It is with this intention that the authorities concerned decided that a primary requirement to commence this task would be an overall plan of development for the Eastern Province that would encompass not only the physical aspects but also the economic, social and environmental aspects of development. The plan will seek to upgrade and rehabilitate the economy to enable it to optimize the use of resources and attain its potential. The following sections deal with the general and specific objectives of the plan, strategies and phasing, the economic and social targets to be achieved and development proposals and actions to be undertaken under the plan.

7.2 General Objectives of Economic Development Plan

The general objective of the plan is to stimulate the economy of the Eastern province to achieve a vibrant and sound regional economy, characterized by diverse investment, high productivity and sustainable economic growth, increasing incomes and reduced poverty levels, social harmony and environmental sustainability by the year 2030. This is in line with the vision for the Eastern Province, which envisages the achievement of the following three fundamental objectives:

A sound regional economy;

Social harmony and cultural diversity

A sound and unique physical and environmental resources.

7.3 The Proposed Planning Framework and Economic Development

The planning framework for the development of this region has been adopted to suit the several socio economic and environmental factors that are inherent to the region. A three phase planning framework has been suggested to take the eastern province from the current state to a state of high economic turnover supporting a high living standard with environmental sustainability and socio political stability. The economy will thus take a similar path with a short-term period of high growth, basically through increased productivity from agriculture, fisheries and livestock, rehabilitation of economic and transport infrastructure and public services to serviceable levels, and short term development of housing rehabilitation and new construction and provision of facilities for setting up of small commercial and business enterprises and improving the provision of financial services. The second phase will concentrate on building of permanent infrastructure facilities for large-scale development activities. The economy is expected to grow more steadily and growth rates may increase slightly but will be high during certain periods. The third phase which, is expected to achieve the long-term targets of high incomes and living standards, but with environmental sustainability, may see growth

rates fall to a more sustainable level, and over a longer period or time frame and also achieve income distributional goals.

There should not be any strict demarcation or limitation in terms of time frame for these phases. Because of the nature of development itself, there should be more flexibility in terms of the time frame, as well as room for overlap between the different phases. For example, Phase 1, which one may consider as a very critical period, may stretch for more than the planned five-year period. In fact a ten-year time frame may be more appropriate for Phase 1, because of the need to restore the infrastructure, services and the people to operational level. This does not preclude the second phase from commencing prior to completion of first phase. The only condition that should be followed in such a case, is that funds needed for the second phase should not be withdrawn from funds earmarked or allocated for Phase one activities. If a longer-term infrastructure or other development project that would be categorized as a Phase 2 activity, is ready for implementation during Phase 1, with the necessary funding already allocated, then this project should be allowed to proceed. The only precaution that must be taken is to ensure that all the necessary preparation and infrastructure facilities needed to implement the project are completed or in place and will not obstruct or hinder any Phase 1 activity that has already commenced or is in operation. Thus more flexibility in setting a time frame and allowing overlap between the phases would be needed in our approach to planning for the Eastern Province, if we are to accommodate the economic development goals of the plan. Details of the rationale and objectives of this phased approach are given in the following chapters.

7.4 Economic Development Plan

To strengthen the economy of the Eastern Province and achieve a provincial real GDP growth rate of between 8-9% during 2005 to 2015, a 7-8% growth rate during 2015 to 2025 and 5-6% growth rate during 2025 –2035. Increase the value of real GDP from Rs 44,700 million in 2003 to Rs 76,200 million by 2010, to Rs 176,000 million by 2020, to Rs 333,000 million by 2030 and Rs 408,000 million by 2035.

- To increase agricultural sector output by 15% and productivity by 25% and increase industrial sector output by 20% by the end of the plan period.
- To promote Eastern Province as a world tourist destination and increase tourist arrivals to 100,000 by the end of the plan period.
- To reduce the unemployment rate from 13% to 11% by 2010, from 11-9% by 2020 and from 9-7% by 2030 by creating approximately 700,000 new employment opportunities by the end of the plan period.
- To reduce the percentage of households below the poverty line from 50% to 20% by the end of the plan period.

7.4.1 Phasing of the Development Plan

7.4.1.1 Recovery Phase (Phase 1)

There is general consensus among the stakeholders that rehabilitation and reconstruction activities must be given high priority. However it is important that such activities fall in line with the medium term and long – term plans proposed for the Province. Under this phase short-term projects will be implemented, with emphasis on projects that can assist in fast recovery and meet the basic needs of the people.

The infrastructure in the Eastern Province is greatly dilapidated and needs significant rehabilitation, reconstruction and development. These problems stem from damage due to the conflict, deterioration of services due to lack of maintenance and stagnation in development and rehabilitation compared to the rest of the island. Rehabilitation will greatly contribute to the

improvement in the living condition of people, including resettled populations and other vulnerable groups.

In general, the availability of expertise and institutional capacity to undertake a major development effort in the Eastern Province appears very limited and early efforts must be taken to recruit and train staff and improve capacity of the institutions. The issue of accommodating the internally displaced persons (IDP) who wish to return to their original place of residence, has to be addressed as a matter of urgency. Some of the displaced persons remain within the region while some have moved to other parts of the island but intend to return. In addition there are significant numbers of displaced people outside Sri Lanka, who may or may not return but may continue to maintain links with their places of birth, thus influencing the economic recovery of the region.

It is also clear that the visible reactivation of development and expansion of opportunities, which are so important for renewed hope and optimism, is severely constrained by the depressed state of the private sector in the province. Therefore local enterprise development will be the key to the effective implementation of economic activities based on agricultural, forestry and fisheries resources. Under the circumstances, the Eastern Province has to go through a process of reconstruction before embarking on a meaningful process of development. Production and productivity improvement in agriculture, livestock and fisheries and the expansion of agricultural diversification, processing and value addition are vital. It is important to note that the Agriculture sector recovery will induce demand-propelled expansion in many other sectors as well.

Proposed activities during this phase:

- Resettlement, rehabilitation and reconstruction activities for the provision of housing and other basic amenities.
- Activities to increase production and productivity in agriculture, livestock, fisheries, agricultural diversification and processing and value addition.
- Training, and capacity building activities.
- Rehabilitation of infrastructure, including roads, telecommunication, power, postal, and port services.
- Increase productivity of existing industries and promote further value addition for such products.
- Restore services, including transport and marketing of both government and private sector to ensure that the population is provided with basic services.
- Facilitate commerce and service activities of both the formal and informal private sector.
- Rehabilitate, develop and promote existing tourism activities in entire eastern region.

7.4.1.2 Transitional Phase (Phase 2)

During this phase the groundwork will be laid for rapid growth. It is expected that, immediate or basic problems hindering development will be resolved by then. In this phase the groundwork and infrastructure necessary for implementing long-term development activities will be implemented. This phase will last from 2011 to 2015. Major programs of new infrastructure development are proposed to accelerate the development process. Such infrastructure development programs should provide facilities to support commercial, industrial, fisheries and agricultural development. For example development of Trincomalee industrial port can be one such major project in the transitional phase. This project alone will create significant development potential for international export/transshipment trade, ship repair, petroleum product storage and distribution, ship chandling and bunkering, tourism, general cargo and bulk cargo handling, coastal shipping,

and for stimulating land side development in the rest of the province.

This has to be supplemented by an ambitious program to develop the transportation, power, communication and the financial services sectors. The coordinated development of infrastructure that reinforces rural-urban linkages and connects product and factor markets will be a key requirement

Proposed activities during this phase:

Major programs for new infrastructure development, including port, roads, power grids, telecommunication lines, irrigation reservoirs, construction of buildings and equipment for services and commercial sector, are some of the proposed activities to accelerate development.

The following activities would be developed in the three districts

Batticaloa – Fisheries and Tourism

Ampara - Agriculture and Tourism

Trincomalee – Ports, and port related activities and Tourism

Social mobilization and livelihood development; promotion of activities geared towards empowering communities to take up or expand environmentally sustainable and economically viable activities.

Such activities may include

Technical training,

Training on financial management,

Assistance with accessing credit,

Assistance with marketing,

Formation of community-level councils to act as decision-making bodies for promotion of environmental management and sustainable development;

Strengthening of CBOs, cooperatives, etc.

Social infrastructure development - packages should be designed to provide funding for works on a scale that will encourage the greatest degree of community participation in all phases of development, including selection, planning, construction, and operation. Through this approach, the communities will take responsibility for the improvements that are made. This will promote more conscientious maintenance, thus ensuring that the long-term benefits to be realized by the community through the improvements will be maximized. There is sufficient scope to include a range of agriculture livelihoods (e.g. coral mining) that may be environmentally damaging. The main agricultural activities that may be supported include.

Improving productivity of paddy cultivation through introduction of new technologies and higher-yield varieties.

Crop diversification.

Home gardens for nutritional supplementation and income generation.

Rehabilitation of tree plantations (coconut, palmyrah, and cashew)

Fuel wood plantations.

Agro forestry for improving microclimate, soil, nutrient and water retention, and production of high value products (e.g. fruit trees)

Value-adding, improvement of handling and processing.

Improvement of livestock rearing and processing of livestock products (meats, dairy products)

Supporting programs to improve on-farm water management.

Improvement of training and extension.

7.4.1.3 Steady Development Phase (Phase 3)

During this phase, it is proposed to achieve the long-term development goals of the Eastern Province, of high economic growth and living standard, environmental sustainability and socio-political stability. A strategy for rapid employment generation will be implemented with a focus on stimulating productivity growth in all sectors, particularly in the agriculture sector.

The primary character of the economy will be changed towards value added processing of regional produce and the development of new products. The human resources and skills needed for growth and structural change and suited to the needs of a dynamic market economy, will be developed and expanded. Explicit recognition must be given to the issues of social harmony and environmental stability by giving priority to balanced sub-regional development and effective resource management.

7.5 Regional Growth Projections

Regional growth predictions have been made on the basis that the plan will become operational from 2005. During the period 1990 to 2002, Sri Lanka's economy grew at an average rate of 4.7 percent. The national GDP was assumed to grow at 6% per annum between 2003 and 2025 and at 5% thereafter. This is based on the assumption that the national economy will perform better than in the past. During the recovery phase of the plan, it is expected to implement a large number of projects aimed at restoring the economy of the Eastern Province to operational level. Particularly, the agricultural and industry sectors will be targeted for increased productivity and hence the rate of growth of these two sectors would be the highest during this phase. The economy of the Eastern Province is also expected to grow at the highest rate of 8.5% per annum during this phase. During the next two phases the rates of growth of the agriculture and industry sectors and the general economy of the Eastern is expected to grow at lower but more sustainable rates. The service sector is expected to grow at a lower rate during the first phase and increase during the second phase and decline again during the third phase. This is based on the assumption that restoration of the services sector would require considerable investment during the first phase, which will enable the services sector to operate optimally during the second phase. During the third phase the growth rate will decline to more sustainable levels as in the other two sectors. Table 7.1 below provides details of expected growth rates within each sector.

Table 7-1 Average Growth Rates by Sector as Compared to National GDP Growth Rates

Period	National GDP. Ave. Growth Rate	Eastern Province GDP - Ave. Growth Rate	Eastern Province Agriculture - GDP Ave. Growth Rate	Eastern Province Industry - GDP Ave. Growth Rate	Eastern Province Services - GDP Ave. Growth Rate
1990-2002	4.7	5.8	7.0	7.0	4.6
2003-2015	6.0	8.5	6.5	12.5	7.5
2016-2025	6.0	7.7	5.0	9.2	8.5
2026-2035	5.0	5.1	3.0	5.8	5.6

Table 7.2 below provides a more detailed breakdown of expected GDP growth rates by the various sub-sectors under the Industry and Services sectors. In the industry sector, construction will be the primary lead sub-sector with high growth rates during the first phase and declining thereafter. It is assumed that a considerable amount of construction work would be required during the recovery phase. In the manufacturing sub-sector, it is predicted that

growth rates will increase during the second phase and decline during the third phase as much of the investment would take place during the first phase with output growth taking place largely during the second phase, followed by a sustainable consolidation phase at a lower growth rate. The trade and tourism, and private services, are expected to grow at increasing rates during the first two phases and decline thereafter. Public services, transport and communication sub sectors are expected grow at high rates during the first phase and decline thereafter, as a fair amount of restoration has been completed as of now.

Table 7.2 Eastern Province - Projected Average GDP Growth Rates by Sub- Sector

Phases	Past Period 1990-2002	Recovery 2003-2015	Transition 2016-2025	Steady Development 2026-2035
Agriculture - Total	7.0	6.5	5.0	3.0
Manufacturing	9.0	7.2	9.8	6.9
Electricity	8.6	4.6	2.7	3.0
Construction	5.6	15.7	9.2	5.5
Industry - Total	7.0	12.5	9.2	5.8
Trade & Tourism	5.6	10.2	10.6	6.1
Transport & Comm	3.3	5.7	4.8	3.0
Private Service	5.8	5.5	8.2	7.7
Public Service	3.5	3.3	2.2	1.0
Banking	5.0	4.9	6.0	6.3
Services - Total	4.6	7.5	8.5	5.6
Total GDP - EP	5.8	8.5	7.7	5.1
National GDP	4.7	6.0	6.0	5.0

Table 7.3 below provides a breakdown of the expected contribution made by the sub-sectors to the economy of the Eastern and the contribution of the GDP of the Eastern Province to the national GDP. The contribution of the Eastern Province to the national GDP is expected to increase from 4.2% in 1990 to 4.5% by 2000 and to 6.4% by 2015, and to the highest level of 7.8% by 2030. The contribution made by the agricultural sector, is initially expected to increase from 30% in 2000 to about 37% by 2010, and thereafter decline to about 22% by 2030. The initial increase takes into account the increased productivity in this sector that is expected during the first phase and level off during the next two phases. On the other hand, the industry sector is expected to increase its output over the entire period thus enabling its contribution to increase from about 20% in 2005 to 34% by the year 2030. The services sector, whose contribution is the highest at present, is expected to decline to accommodate the increase in the industry sector, during the initial phase. However, this sector's contribution is expected to increase when the economy reaches a sustainable growth level during the latter half of the second phase and up to the end of phase three. The services sector will be the largest contributor to the regional economy, by the end of the third phase. This is generally a characteristic of a developed or mature economy.

Table 7.3 Eastern Province Projected Sectoral Contribution to GDP

Year	Agriculture Contribution to EP -GDP %	Industry Contribution to EP-GDP %	Services Contribution to EP-GDP %	Eastern Province GDP as % of National GDP
1990	33.0	15.2	51.8	4.2
1995	39.8	14.9	45.3	4.6
2000	30.3	24.8	45.0	4.5
2005	38.1	19.8	42.1	4.8
2010	37.6	24.0	38.4	5.5
2015	32.3	28.1	39.6	6.4
2020	28.6	29.8	41.6	7.0
2025	25.1	32.1	42.8	7.4
2030	22.4	33.9	43.8	7.8
2035	20.6	34.4	45.1	7.5

7.6 Proposed economic development strategy to achieve the above mention objectives.

The strategies adopted should facilitate the growth expectations outlined earlier. During the recovery phase, the major thrust will be to accelerate productivity in the agricultural sector, by removal of all bottlenecks. Thus efforts are needed to smooth the flow of inputs needed by the agriculture sector, such as fertilizers, chemicals, labor and machinery, and marketing of produce including transport, warehousing, milling and processing of output. The requirements of the fisheries and the livestock sub-sectors should also receive similar attention. Infrastructure required to facilitate productivity, must also be rehabilitated to operational levels. Thus a program of rehabilitation for restoring the infrastructure such as roads, markets, electricity, communication, water services, irrigation, essential for increasing the productivity of this sector must be initiated concurrently the programs for accelerating productivity. The run down tourism infrastructure needs to be brought back to operational standards, if this sub-sector is to quickly return to previous levels of operation. In the industry sector, small, medium as well large industries, which have deteriorated due to the war, must be given financial back up in the form of a loan or other financial assistance to restore their production to higher levels. In addition, assistance must be provided to revive existing industries suffering from poor supply of raw materials, obsolete machinery, lack of trained manpower, or lack of marketing, to reach higher production levels. New industries should be provided with financial incentives such as low interest loans, reduced taxes, and marketing facilities.

Phase two of the plan is earmarked for large infrastructure investments, to modernize roads, railways, airports and ports, and to provide power, water, and communication services, to construct new irrigation systems, fisheries and new tourism infrastructure. The bulk of the investments in new major industries as well as medium and small scale industries would be undertaken during the second phase, as considerable growth is expected in this sub-sector during this period. Much of the value addition industries from the agriculture, fisheries and livestock sub-sectors will also be promoted during this period. The third phase is expected reap the harvest of these investments and also increase productivity of existing and new investments. The manpower training and capacity building activities, which would start in phase-two, would be continued at a greater pace during the third phase. The bulk of the activities in the services sector including the expansion of financial, marketing, trade and exports which is expected to be undertaken during the second phase, would be consolidated and expanded during the third phase.

7.7 Sectoral development plans

The physical structure plan provides a planning framework for developing the sectoral plans, by a spatial demarcation of the suitable areas for various development activities. The advantage of having such a physical plan is that it provides the sectoral planner valuable information on the advantages and limitations of the land and natural resources available for development to meet the socio-economic, cultural, aesthetic and other goals of the economic/sectoral plans. The physical plan, while providing information on the existing development also identifies the potential for new development on a spatial basis, and spells out the limitations imposed by the requirement for environmental sustainability of any development activity. The physical planning process will also invariably identify new developments that would be required to meet at least part of the social, economic, cultural and aesthetic goals or objectives of the population of the region. Further development of the physical, human and entrepreneurial resources is the task of the economic/sectoral planner. Another dimension that would be incorporated in this process of transforming the physical plan to an economic plan is the financial and economic component. No development can take place without this critical input, and the planner has to face two constraints in undertaking this task, namely, physical and economic. Thus a system of prioritization and phasing of development activities has to be adopted, when facing financial constraints in addition to any

physical constraint identified by the physical plan. Thus a sectoral plan will attempt to determine the most suitable ways for resolving the issues identified in each sector, and transform these solutions to programmes and projects, identify the investment requirements, try to find funding sources, and implementation capability to initiate these development activities as constrained by physical aspects as well as by the limited financial, human and other resources available in the region.

The sectoral plans presented in the following chapters, provide a broad framework for the achievement of the economic and social objectives of each sector. An analysis of the issues identified in each sector is presented in a separate volume of this report. This volume provides a detailed analysis of the present situation, the issues identified from a SWOT analysis and discussions with stakeholders and other interested participants. The sectoral plans for the following sectors are presented in this volume; agriculture, irrigation, fisheries and aquaculture, livestock, industry and tourism, social infrastructure (education and health), physical and economic infrastructure (transport, water, sanitation, drainage and solid waste management, energy, telecommunication, port and airport development), and institutional development. Each sectoral plan spells out the objectives, the strategies and specific programmes and activities, including policy changes required for implementation where appropriate. The sectoral plans include projects already identified under the physical plan as well as programmes and projects identified under sectoral development for the whole region. The location of particular projects or activities that are area specific, are within the zones identified by physical plan, while programmes or projects that are only sector will apply to the entire region. For example, projects for port and highway development, irrigation reservoirs, or wild life parks would be located within the zonal parameters established by the physical plan, whereas projects for agricultural credit, technology transfer, training, water management etc. would be sector specific and applicable to the whole region.

The projects and programmes developed under the sectoral plans have been phased out in line with the phasing adopted under the planning strategy for the entire plan. On this basis, projects and programmes have been identified for the recovery, transition and steady development phases of the plan. However, it is proposed that there should not be any strict enforcement of this phasing criterion when implementing projects. For example, if a project earmarked for the second phase is funded and ready for implementation during the first phase, there would be no objection to starting this project early, provided that funds originally earmarked for a phase one project are not transferred to this project. Thus funding sources, readiness for implementation, and other criteria may be used in taking a decision on such projects. On the same basis, projects to be implemented in phase one may also be implemented in phase two or three if the funding criteria are satisfied. Projects not identified in the plan may also be taken up for implementation under any phase, if such projects fall within the broad framework of development and goals and objectives of the plan. Projects and programmes developed in the sectoral plans are at different stages of evolution, while some projects are at the conceptual stage, a few others have gone further into magnitude and scope. However a large majority of the projects need to be developed much further, and may need detailed cost benefit and environmental analysis. It is not possible even to provide rough estimates of the cost of the plans at this stage. A majority of the programmes and projects identified would anyway be subject to detailed evaluation and analysis by any donor willing to finance the projects. The large list of project ideas, concepts, strategies, policies and actions, as well as list of projects and programmes with substantially more details, provided in the sectoral plans can be picked up by donors for further processing and development.

8 CHAPTER 8 : AGRICULTURE DEVELOPMENT PLAN (ADP)

8.1 Introduction

The agriculture sector in the Eastern Province is one of the major sectors in the province's economy it is also a fact that stands true for the total island. Agriculture sector in the province is a sector that is ill supported through the years and the prolonged conflict has increased the gravity of the situation. However, tremendous negative impact due to the civil war is observed in which includes reduction in the extents of land used for paddy cultivation, which is the major economic crop in the province. Rapidly declining livestock population too had been observed due to the war (North East Irrigated Agriculture Project, Social Profile). The majority of the agricultural population in the eastern province fall below the poverty line and the farming is carried out in a subsistence level. The amount of cultivated land compared to pre-war era has shown a sharp decline showing extensive potential for improvement.

The agricultural development plan for the Eastern Province is developed in line with the main regional physical planning exercise with the primary objective of eradicating poverty and providing food security in the region and changing the current subsistence agriculture to doing farming as a business in the long run. Commercializing agriculture is hoped to result in many people being able to earn incomes to meet other needs, improve their lifestyle, create more jobs in rural areas, ensure food security and use natural resources in a sustainable manner.

In order to develop the agriculture sector in the Eastern Province it is important to recognize the resources available such as land, water, human resources to develop the agricultural potential and increase productivity. This would mean the public institutional fabric in the support services and infrastructure such as agricultural advisory services, health services, road network, irrigation and water management, access to improved seed material, knowledge, information about good storage methods, processing and marketing should be in place.

Development in agriculture will also need the support of public institutions such as provincial council, district council, department of Agriculture, Agrarian services department etc. There is a need for empowering local authorities to ensure they have the necessary capacities to undertake those new challenges. It is expected that the local government will deliver efficient agricultural services through collaboration and mobilization of local and external stakeholders, NGOs, CBOs and donor community as well as the private sector. Efficient sectoral integration and coordination through institutional strengthening and capacity building is a core necessity. The public sector should focus on enabling and creating the environment for a market oriented agriculture sector, leaving the production, processing or marketing agricultural products to the private sector through efficient facilitation.

Farmer training, agricultural education in the schools and transfer of modern and appropriate technology through awareness programs will be given high priority in the plan. Through advisory service and knowledge building, farmers should be provided with skills to re-orient their production towards the market in the long run. It is imperative that the government should create an environment, through policies, regulation and infrastructure, providing the basic fabric for a strong private sector involvement necessary to achieve the ADP's goals and objectives towards the development of agriculture in the Eastern Province.

8.2 General Objectives

To strengthen the economy through agricultural transformation in the Eastern Province, resulting in a competitive, profitable, sustainable and dynamic agricultural and agro based industrial sector in the province via eradicating poverty and providing food security. Consistent with the physical planning strategy for the

region, the Agriculture Development Plan of the Eastern Region seeks to adopt an integrated approach by simultaneously dealing with interrelated areas such as policy, regulation, land, irrigation, agricultural roads, agriculture related institutions and agro-based industries.

8.3 Specific Objectives

To increase Regional annual agricultural sector growth by 5-8% during 2004 to 2010, 8-12% during 2011 to 2020 and 10-8% 2021 - 2030.

Poverty alleviation through increased productivity of resources and inputs. To increase the per capita income through Agriculture considering the current dominance in the sector in the economy.

Improve the people's nutritional level and provide food security through adequate production of food and nutritive products.

Ensuring that all intervention programmes are gender-focused and gender responsive

Sustainable natural resources management programme and prevention of adverse environmental impacts through the control of externally (purchased) inputs and their balanced use.

8.4 Agriculture development strategy

In general terms the agriculture sector in the Eastern Province is the predominant sector of the economy and is overwhelmingly subsistence-oriented. The detrimental situation during the last 20 years certainly has worsened the situation. Currently this highly potential sector is grossly ill served with no or minimal access to modern productive inputs and technology delivery services. Development the sector from the current neglected situation needs considerable resource allocation and careful panning.

The strategy for the Agricultural sector "integrated development of agriculture through sustainable and poverty alleviation-oriented economic growth "

An integrated top-down bottom-up approach will be adopted in the development strategy. The Agricultural development plan in line with the regional physical planning strategy can be divided into three phases during the period from 2005 to 2030 (25years).

Phase I – Recovery Phase (2005 to 2010)

Priority will be given to improve people's nutritional level and food security through the production of food and nutritive products. Basic infrastructure such as the basic, usable road network, storage and marketing facilities and input supplies will be given priority to facilitate agricultural production. Map 8-1 depicts the allocation of lands for various agricultural activities during this period.

Phase II – Transition / Consolidating Phase (2010 to 2020)

Thrust areas will be new investments, commercial agriculture, agri-industries, industrial development, and efficient administrative and service sector and efficient inter-sectoral coordination. Selection and distribution of inputs and market facilitation

Phase III – Developing Phase (2020 to 2030)

Concentration during this phase will be on increasing productivity, efficiency, and cropping intensities, export oriented agro industries, value addition etc.

It is imperative that the parallel cross-sectoral development in areas such as irrigation, roads, electricity, industry and trade should also be planned and effectively implemented with a view in making a positive contribution toward meeting the objectives of the agricultural sector.

Based on projection it is envisioned that agriculture related industrial and land use activities are expected to shape the outcome of the Ampara agro based urban agglomeration. The related infrastructure to support irrigation, agro base and food processing related industries at cottage and corporate levels are expected in this area. This urban agglomeration will be formed in combination of two 3rd order urban centres viz, Kalmunai, Samathurai and six 4th order urban centres viz, Dehiathakandiya, Akkaraipatu, Pothuvil, Damana, Thrukkovil and Uhana.

The agro based urban agglomeration is expected to be in full force during 2020 to 2030 and is expected to support the third phase of the agricultural development plan, providing infrastructure to support the expected hive of activities in all sectors including agriculture and related industries. The Ampara agro based urban agglomeration will be facilitated by the district level, de-centralized economic centers (See Map 8-2).

The broad strategies for achieving the ADP objectives are to:

Making poverty eradication the overriding objective of agricultural development through increasing the cultivated area, improving irrigation, increasing cropping intensity especially in the paddy sector to 150%

Guaranteeing food security through the market and improved incomes, thereby allowing households to specialize, rather than through household self-sufficiency

Enhancing women's participatory role in agricultural development and develop their leadership in productive activities

Aggressively advocate new trends/new thinking in agriculture and encouraging new crops, cropping patterns agronomic practices stemming from market demands and trends.

De-centralization to lower levels of local government for efficient service delivery

Removing direct government involvement in commercial aspects of agriculture and promoting the role of the private sector

Promoting a integrated bottom-up and top-down planning and budgeting processes by empowering local governments and enabling them to influence public policy and allocate public resources to alleviate location-specific constraints in a non sectoral manner

Ensuring the efficient co-ordination of the multi-sectoral interventions to remove any constraints to agricultural development.

Supporting the dissemination and adoption of productivity-enhancing technologies

8.5 Specific Strategies

To cultivate the entire asweddumised paddy lands in the province during the period of 2004 to 2030.

To increase the average yield in paddy production in the province to 4500 – 5000 mt per ha in potential locations during the period of 2004 to 2030 (average production in 1999/2000 Maha season was 3780 Mt/ha, (paddy statistics by dept of senses and statistics 1999/2000 Maha)

To diversify the agricultural activities by introducing new varieties of crops, modern intensive agricultural techniques, export oriented agriculture (floriculture, fruit culture, introduction of new food crops to the area through crop diversification etc.)

Promotion of agro-based industries and industrialization through diversification and commercialization of agriculture. Introducing value addition through the promotion of Agriculture related industries.

Encourage micro finance institutions for the agricultural sector.

Loans for agricultural business such as the support services, processing and value addition.

To provide necessary infrastructure to develop Ampara as an Agro based development area locating a centralized marketing system. The central system to be linked with the sub systems of Trincomalee and Baticaloa districts

To introduce the production of grasses, maize, soybean and sorghum in the low yielding areas in the province as ingredients for animal feed and mixes.

8.5.1 Crop agriculture

This development strategy will focus on rehabilitation of some of the irrigation schemes based on potential crop diversification in to rice fields with high value vegetables, fruits and other field crops, commercial cultivation of selected fruit crops by private entrepreneurs, establishment of agro-based industries, replanting coconut and cashew, strengthening research and extension supports and restoring rural roads and markets.

The diversification of rice field is advocated because the irrigation infrastructure is already available, farmers are used to the cultivation of the other field crops. Farmers will be more receptive to better management of the water resources and will be able to handle the new crops or technologies that would give higher returns than at present. The demand for certain vegetables and fruits is on the increase with a growing urban population and the tourism industry. There is also an export potential for selected fruits and vegetables in the fresh and processed forms. Production of fruits and vegetables outside the rice growing area will be promoted by allocating lands in extant of 10-20 ha in suitable areas to promote investors. The nucleus farm / out growers system will be emphasized to involve larger number of small growers so as to render agro processing and marketing commercially viable.

While priority will be given to meet the domestic demand export markets also will be sought parallel fashion. The region will stimulate the development, growth and sophistication of the existing market networks giving priority to the roads linking producing areas with market s and by expanding revolving credits, training and other support services. The approach to agro industrial development will be to be establish industrial zones provide credit lines to enable firms to re establish their operations and to promote private sector initiatives in establishing new industries.

The existing provincial research and extension system should be reorganized and strengthened to ensure that they provide the necessary support to the newly oriented agriculture. Training of staff and farmers should be intensified. The training programme offered by NGO's and farmer organizations should be coordinated and supported. Research in horticulture should be intensified while universities (Eastern and South-Eastern) should be supported to undertake research on post harvest technology and start courses in food processing and technology.

8.5.2 Agro-Based industries

Development of agro-based industries has two main aims. One is to promote farm produce thus adding values and creating additional employment opportunities locally. Second is to manufacture, repair and service the machinery, equipments and tools used by the farmers.

The development of agro-based industries is justified by the fact that the province is already a surplus-producing region in respect of paddy, maize, cassava, groundnut, mangoes etc. The proposed crop diversification and horticultural development activities will lead to increased production of more grains and fruits, which would be available for processing. Assistance should be given to entrepreneurs to establish and expand agro-based industrial units.

Map 8-1 Agriculture plan - 2010

Map 8-2 Agriculture plan - 2030

Table 8-1 : Actions for Agricultural development in the region

Related Area	Changes deemed necessary
Land	Preparation of land Suitability and land use plans. Classification of soil and recommendation of crops accordingly Promotion of home gardens with vegetables, and fruits and coconut at every G.S.N. divisions. Development of agro-forestry, community forests with participation of beneficiaries Scrub lands and barren lands utilized for cashew and agro-based industries
Paddy	Using irrigation water for paddy in poorly drained soils. Diversification of well drained paddy soils for cultivation low water requiring high cash crops. Better water management practices Tube wells and open agro-wells in both high lands and in paddy fields. Integrated Pest Management (IPM) Organic recycling and green manuring St. Fertilizer application on soil test values Better Water Management practices Cultivation of high yielding and high output price varieties(eg. Sumba) in high potential areas. Use of quality seeds Proper weed, Pest and disease control Timely harvesting Use of Mechanical threshers. Land leveling, Flood and salt exclusion methods and drainage facilities. Increase irrigation facilities. Use short aged varieties wherever applicable, Self seed paddy production Private Seed Farms Special seed paddy production projects under a tank. Educating Farmers to cultivate low water requiring / high value crops in well drained paddy lands instead of paddy
Other Field Crops (OFC)	Processing and value addition and utilizing in provender industries. Extensively cultivating in Marginal lands under rain-fed conditions. Cultivating grain legumes in residual moisture in paddy fields Inter cropping with perennial crops. Self seed multiplication and nuclear farms linked with out-growers. Vegetables seed nurseries. Utilizing well-drained paddy lands for vegetables, Red Onions and chilies Provision of open, dug, agro wells and tube wells in recommended areas Improved water management practices and water saving irrigation methods as Drip irrigation, Subterranean by items Transferring post-harvest technology to producers Improving local storage methods in villages. Promoting off-seasons cultivation Cold storage, processing and value addition. Areas specialization of crops. Market information to primary producers. 'Farmers Fair" (as in south India) where facilities are provided for primary producers to sell their producers under the special control and monitoring system of local authorities. Re-structured Research and Extension setup. Incentives to promote commercial farms with out-grower systems along with agro processing units. Popularizing usage of pigeon pea and soybean in rural diets. Oil extraction from sunflower at cottage levels. Cultivation of less water and input requiring crops such as sesame along with oil extraction facilities. Finding markets and expanding cultivation of betel wine. Special projects managed by group farmers under village tanks. Nucleus farms to arrange inputs, farm power, technology transfer, post harvest handling, value addition and processing. Contractual cultivation to supply raw materials to agro industries such as livestock feed mills.
Fruit crops	Promotion of plant supplies nurseries. Selection of mother plants Practical trainings to producers Forming closer linkage among producers, and private traders and promoting market information. Organizing private sector farmers setting up medium –large fruit gardens of mango, banana and pineapple. Fruit processing units Supply of adequate planting materials and awareness programme. Selection of drought tolerant fruit trees such as wood apple and promoting cottage level jam and fruit drink production.
Multi purpose tree crops(coconut)	Expansion of coconut nurseries and reestablishing coconut seed farm. Home garden development with coconut palms. Distribute subsidized coconut seedlings for homesteads, planting advise on incorporating green manure annually. Establishment of farmer training center and classes. (i) Kaliodai (ii) Uhana Construction of research and parasitoid breeding units.
Cashew	Providing financial supports to Srilanka cashew corporation to expand the bud graft supply programme
Palmyra.	Technology transfer for palmyra products. Awareness programme. Palmyra based agro industries. Strengthen research nit in PDB to develop improved technology for fruit, sap and fibre based products.

8.6 Priority Areas of Action

Based on agricultural community's perspectives, It is important to set out principles governing the roles of the public and private sectors in ADP. Priority areas for public action are outlined below:

8.6.1 Research and Technology Development

The main aim of this component is to make research and technology address the needs of subsistence farmers. A decentralized client-oriented and participatory formulated research agenda to ensure more relevant and responsive advice will be formulated with all stakeholders.

Priority areas for research and technology development include:

- Decentralized research and Technology development and dissemination.
- Socio-economic research (whether technologies and information work the needs of farmers and contribute to ADP objectives)
- Appropriate basic and strategic research to enable the region exploit new international technological developments.
- Farm power/machinery
- Post-harvest and value addition technologies.
- Land and sustainable production.
- Agriculture Department and other related national research organizations should take a lead in this and should develop a medium term plan for implementing these priorities.

8.6.2 Agricultural Advisory Services

To coordinate service provision to subsistence farmers should be created to provide advice on productivity enhancing technologies and soil conservation; knowledge and skills development; marketing, storage and agro-processing. The farmer committees which are expected to be formed in every GN division level will work with PC and DS officers to contract private sector service providers for extension services wherever possible. Farmers are expected to demand, manage and monitor the advisory services that meet their needs. Accordingly a new approach to agricultural service delivery should be developed.

The main features will be:

A demand driven system through farmers' for the extension services

System operated through contractual arrangements and by private institutions rather than by public employees

Private sector to provide advisory services

Linking advisory services to other services, e.g. marketing, credit, research.

Priority areas are:

- Districts to develop strategic plans for agricultural development (through participatory processes)
- Functional capacity analysis of the relevant public institutions to design and implement multi-sectoral programmes
- Strengthening technology system and pathways
- Setting up linkage and coordination mechanisms

8.6.3 Agricultural Education

Priority areas for public action are

Incorporating agricultural education in the education curriculum at all levels of primary and secondary schools, tertiary institutions and universities.

Functional adult education systems through awareness programs, exhibitions, model farms etc.

8.6.4 Rural Finance

Rural financial Intermediaries will be promoted and strengthened for provision of rural financial services on a viable and sustainable manner. The public sector will provide a legal and regulatory framework as well as capacity building for private sector involvement in Micro-finance institutions (MFI). Government should no longer provide rural finance but will create conducive environment for private sector and civil society.

Priority areas are:

- Conducive legal and regulatory framework for micro-finance institutions (MFIs)
- Capacity building for MFIs.
- Promotion of formal banking system involvement in rural finances.
- Promotion of other MFI initiatives.

8.6.5 Agro-processing and Marketing

Government will not provide free inputs or market farmer produce. Instead, inputs distribution, agro-processing and marketing will be carried out by the private sector, while the public sector will set policies, remove barriers and put in place commercial laws as well as legal and regulatory framework. The public sector will be responsible for providing supportive infrastructure, including rural electrification, which is critical to achieve the ADP goals and objectives.

In order to facilitate the above the government should provide support in:

- Road network.
- Market infrastructure (e.g. economic centers like Dambulla)
- Market information.
- International Marketing Access.
- Storage and Agro-processing.
- Agricultural inputs.
- Legal and Regulatory Framework.

8.6.6 Land and Water Management

Develop a comprehensive land use plans and land-use policy to facilitate development of land markets, efficient land-use (including irrigation) and management as well as administration. Priorities are:

Land Acts should be re-visited Land Sector Strategic Plan to be developed in view of Agricultural development

Development of land use plans at community, GN, district and provincial levels

Water for crops, livestock inland fish farming

Encourage supplementary low cost irrigation, rain water harvesting

Sustainable use and management of forestry (refer forestry sector strategic plan)

Environment issues including bio-diversity, wetlands, and grasslands lands, ground water.

8.6.7 Physical Infrastructure

Government will spend its money on will be the development of basic physical infrastructure that will support the efforts to develop the agriculture sector. These include: irrigation, roads, rural electrification, communication infrastructure and energy development programmes.

Priority areas are:

Rural electrification (accelerating rural electrification and use of renewable energy sources).

Rural road network (especially feeder roads and bridges)

Water and irrigation infrastructure.

Communication infrastructure (FM radio stations, mobile phones, internet facilities)

Future Agriculture Production in relation to the physical planning strategy and the predicted RGDP growth and Sector contribution is described in Chapter 7 above.

8.7 Proposals and Action Projects

Project 1: Productivity Improvement in Irrigated Rice farming in the regions of High Yield potentials in the Eastern Region.

Project 2: Providing storage facilities to maintain buffer stocks.

Project 3: Establishment of Farm Machine Centres

Project 4: Renew and revive the agric-research centres at Karadian Aru and Sammanthurai.

Project 5: Strengthening the Additional Assistant Director of Agriculture's Office at Addalaichenai, Ampara District.

Project 6: Soil classification and recommendation of crops in the Batticaloa District.

Project 7: Establishment of Soil Testing Laboratories.

Project 8: Establishment of farmer companies at every Agric. Service Centres.

Project 9: Agricultural Productivity villages.

Project 10: Agro well development.

Project 11: Micro Irrigation Development (Sprinkler, Drip or Tape System)

Project 12: Maize Programme

Project 13: Chilli Programme.

Project 14: Modernizations of rice mills to increase output and improve rice quality to international standards.

Project 15: Development of rural level agro – processing enterprises.

Project 16: Assistance to expand coconut cultivation :

Project 17: Expansion of Cashew cultivation

Project 18: Encouragement of Oils seed cultivation

Project 19: Expansion program for horticultural crops

Project :I Productivity Improvement in Irrigated Rice farming in the regions of High Yield potentials in the Eastern Region.

The present yield in the region varies from 3 to 4.5 Mt / hac. This yield level can be increased to 6.0 – 6.5 Mt / ha in the high potential major irrigation areas under this project. Paddy seed production will constitute on important line of emphasis with area concentration in Amparai and in limited areas of Batticaloa and Trincomalee.

Areas : High potential areas are identified as follows in all three districts.

Ampara District : Pottuvil, Sainthamaruthu, Akkaraipattu, Kalmunai, Addalaichanai, Uhana, Irakkamam, Central Camp, Palamunai Damana Nintavur

Batticaloa District : Vallavelly, Kiran, Aithigamalai, Valaichanai, Mandapathadi, Eravur, Karadian Aru, Mandur, Vantharumoolai

Trincomalee District : Seruwila, Muthur , Kantalai, Thoppur, Vannale, Munnapodivaddai, Agbopura, Killiveddi, Padavi-Sri-pura, Pankulam

Project : 2 Providing storage facilities to maintain buffer stocks.

The Seasonality in rice production leads to low farm – gate price in rice producing areas. Therefore, in the long run, it is essential in maintaining buffer stocks in order to stabilize the market price.

Areas : All agrarian service centres in the Eastern Region where paddy is grown largely.

Facilities to be provided : Poly – prop storage cocons

New storage for seed

Rehabilitation of existing storage.

Project : 3 Establishment of Farm Machine Centres :

With the objective of reducing the cost of agricultural production and facilitate farmers to begin cultivation at the right time it is proposed to establish 17 farm machine centres in selected D.S Divisions in all three districts.

Ampara : Pottuvil, Akkaraipattu, Nintavur, Sammanthurai, Uhana, Damana.

Batticaloa : Porativu Pattu, Manmunai South-West, ManmunaiWest, Eravur Pattu, oralaipattu.

Trincomalee : Pudavisripura, Morawewa, Thampalakamam, Kanthale, Seruvila, Muttur.

Machinery and equipments to be supplied :

Tractor – 2 wheels

Tractor – 4 wheels

Rotavators

Tine tillers

Disc Harrows

Mud Wheels

Rotary Weeders

Threshers

Combined Harvesters

Reapers

Poly – prop threshing floor layers.

Project : 04 Renew and revive the agric-research centres at Karadian Aru and Sammanthurai.

The Karadian Aru complex at one time had research, education and training and seed production units under the same roof and functioned very effectively. Therefore Karadian Aru Research station should be renewed and revived to play an active role in Agric. Research Development and Extention. This station must be developed to undertake research in paddy , OFC and fruit crops. At the same time the research station at Sammanthurai must be developed to undertake research specially in paddy.

Project : 5 Strengthening the Additional Assistant Director of Agriculture's Office at Addalaichenai, Ampara District.

The coastal belt in the Ampara district plays an important contribution to the paddy production of the Amparai district. Providing proper Agric. Extension services will positively contribute to increase the paddy yield considerably.

Project : 6 Soil classification and recommendation of crops in the Batticaloa District.

The soil classification presently existing does not tally with the present soil groups especially in the Batticaloa district. Therefore, the soil classification should be done along with the recommendation of suitable crops.

Project : 07 Establishment of Soil Testing Laboratories.

Develop soil test laboratories and thus practice soil testing as part of fertilizer use package.

Location : Sammanthurai, Karadian Aru, Trincomalee.

Project : 08 Establishment of farmer companies at every Agric. Service Centres.

Farmer companies have to be introduced as a mode of operation in the process of transforming traditional small farm agriculture into a commercially viable a profitable economic venture. Farmer companies could solve farmer problems in procurement of technology, agric. Inputs value addition, storage and marketing of agricultural produce.

Various production activities including production of quality seed paddy, sale of paddy and rice, production of allied products, fruit, vegetables, organic fertilizer, processed food and beverages such as king coconut water can undertaken by farmer companies.

Project : 9 Agricultural Productivity villages.

Develop villages for the improvement of agricultural productivity and develop agro enterprises and income generating activities.

Locations :

Ampara District : Akkaraipattu, Sammanthurai, Uhana.

Batticaloa District : Pullumalai, Oddamavadi

Trincomalee District : Kanthalai, Padavisripura, Muttur

Project : 10 Agro well development.

Program for the stabilization of dry zone rainfall highland agriculture by the provision of open shallow dug wells for conjunctive use of ground water as a source of irrigation to promote year round crop production of high value. A construction subsidy of Rs. 30,000/= per agro well is to be provided for selected farmers under the programme and a supply of a water pump and accessories is arranged through a bank loan for the suitable beneficiaries.

Project : 11 Micro Irrigation Development (Sprinkler, Drip or Tape System)

Enhancing productivity of agro wells through improved water management and conservation together with new production technology to maximize crop production and income generation.

Project : 12 Maize Programme

Train the farmers presently engaged in maize cultivation to increase average yield from 1700 to 3400 kg / ha

Project : 13 Chilli Programme.

Train selected farmers presently engaged in chilli production to increase average yield and expand the chilli production.

Project : 14 Modernizations of rice mills to increase output and improve rice quality to international standards.

Provision of technical guidance to the rice millers in the Eastern Region to improve their rice recovery level and to improve the quality of processed rice. It is important to improve the quality of locally produced rice to international standards and reduce production costs in order to compete with rice production in other countries.

Project : 15 Development of rural level agro – processing enterprises.

Processing agric. Produce is carried out mainly in urban areas and the farmers market their produce the unprocessed form. If process could be done by farmers themselves at farm level, they could appreciably increase the market value of their produce and there by significantly increase their incomes. The following agro-processing enterprises can be undertaken in the rural sector.

Rice parboiling and processing at rural level.

Rice / gran floor processing

Dehydration of fruits & vegetables.

Project : 16 Assistance to expand coconut cultivation :

This project will help to complete the replanting of coconut affected by 1978 cyclone. Up to now, the replanting programme is continuing to meet the grant element of supplying to expedite the completion of replanting and continue with a new plantation scheme in the Eastern Region since this region has a large comprehensive advantage for coconut cultivation.

Project: 17 Expansion of Cashew cultivation:

Cashew is me of the promising crop in the Batticaloa and Amparai districts, from which a substantial amount of foreign exchange be earned. Therefore expansion of this sector is very vital. A factory must also be established in the Batticaloa district for utilization of cashew. (There is already a factory at Giranthurakotte in the Amparai District).

Project 18: Encouragement of Oils seed cultivation

Oils seeds such as gingely, soya, castor, sunflower, ground nuts and other crops such as green gram an black gram are to be encouraged as all loamy soils of the province could be profitably utilized for the crops.

Project 19: Expansion program for horticultural crops

Greater use will be made of the untapped potential offered by horticultural crops such as plantains, Jak, Mangoes, citrus and grapes. The province has proven experience in the cultivation of these crops and a well managed area expansion programme is all that is needed.

9 CHAPTER 9: IRRIGATION DEVELOPMENT PLAN (IDP)

9.1 Introduction

The high incidence of rural poverty in the Eastern Province is associated with low land-productivity due to low rainfall, poor support services, and poorly performing and incomplete irrigation infrastructure. The irrigation sector is of fundamental importance in promoting economic growth in the rural agro based economies. The sector development strategy focuses on infrastructure and institutional development for sustainable water management, with special emphasis on stakeholder participation.

In the province, Irrigation Development Plan will play a critical role in the development of agriculture and will be a key driving force of the Agriculture Development Plan (ADP) of the region. As one of the principal inputs to food production, irrigated agriculture in the Eastern Province is expected to play a critical role in achieving food security and poverty alleviation and improving the quality of life for the people in the eastern province.

9.2 General Objectives

To enhance the productivity in the Agriculture sector by improving and providing sustainable irrigation infrastructure.

To protect and increase Agricultural production through rehabilitation of existing irrigation schemes and protect the schemes from heavy floods.

9.3 Specific Objectives

To maintain and manage catchment area, diversion programme to supplement major tanks, which are presently not getting sufficient water to fill up. Eg. Construction of Heda Oya Reservoir upstream of Nevalan Anicut scheme

To rehabilitate 50 minor irrigation tanks in each district to provide surface irrigation.

Development of lands and water resources for irrigated agriculture and flood control.

Provision of irrigation and drainage facilities for cultivated land in agriculture and drainage projects.

Promotion of potential crop diversification into rice fields in some irrigation schemes with high value vegetables, fruits and other field crops with less water consumption used.

Proper water management for production of crops through institutional development and water management strategies.

Formation of farmers organizations (FOs) to improve the productivity in paddy areas of irrigation schemes and conduct regular training courses for them for waste management and participatory approaches in all activities in the scheme.

Rehabilitation and Reconstruction of a scheme, where human resettlement is promoted, have to be done under a crash programme.

Promotion of lift irrigation using wind mills where wind potential is available in plenty for irrigating subsidiary cash crops in high land areas. Also to promote non conventional irrigation techniques such as drip and lift irrigation systems to maximize the use of available water for diversify the crops and to increase the recharging rate of the underground water tables.

For example: 05 village tanks in the Thuraineelavanai area are fed by the Department of Irrigation; pumps for lift irrigation to paddy lands and to recharge the underground water to enable the villagers to obtain water from open wells for domestic purposes.

To rehabilitate major and medium irrigation tanks in all 03 districts on a crash programme to provide surface irrigation or for paddy cultivation and to provide drinking water to the proposed development areas. For example; Proposed Unnichchai Major Irrigation and water supply scheme under ADB. On completion, this

scheme will provide water supply to Batticaloa Municipal area, Kathankudy Town Council, Eravur, Chenkalady, Vantharimoolai and Arayampathy areas for domestic and industrial purposes.

To implement a programme to recharge the underground water tables in the Batticaloa District in the western areas where the ground water tables in the Batticaloa District in the western areas where the groundwater supply saved by the improvement in the rain water retention.

To promote farming activities from the less water available areas to where land and water are more available. For example: Gal Oya system areas, Heda Oya scheme areas.

9.4 Planning Strategy for Irrigation of Agricultural lands

Planning for the development of this region with regard to irrigation sector should be based on the several socio economic and environmental factors that are inherent to the region. Therefore the planning framework for the development of irrigation sector in the Eastern Province could be designed to take up this phase approach from the present conditions to a state of condition with higher economic turnover or income to farmers resulting a higher standard of living with environmental sustainability and socio economic stability.

Phase I termed as Recovery Phase with a period of recovery of irrigation systems will be 06 years from 2005 to 2010. Short term projects such as urgent rehabilitation of irrigation systems, urgent needs of strengthening FOs, Farmer's Training, etc could be met. The following major irrigation tanks may be selected under this phase for rehabilitation (See Map 9-1 Irrigation plan 2010). It is also possible to take up 50 minor irrigation tanks in each district for rehabilitation during this phase by the Department of Agrarian Services.

Table 9-1 Tanks to be rehabilitated in Trincomalee district by 2010

No	Name of Tank	Acreage	Agency for ownership and Maintenance
1	Anden Kulam	454	Provincial Irrigation Dept, NEPC
2	Ethabediwewa	213	-- do --
3	Ethandamuwippu tank	204	-- do --
4	Galmetiyyawa Tank	624	-- do --
5	Ikaibantha Tank	350	-- do --
6	Kinilakada Tank	325	-- do --
7	Kuranlenpanchan Tank	500	-- do --
8	Medawachiya Tank	367	-- do --
9	Maduwa Kulam	261	-- do --
10	Mahakalampathi Tank	740	-- do --
11	Panmadawachchiya Tank	120	-- do --
12	Paranpachan Tank	(Domestic)	-- do --
13	Perian Kulam	310	-- do --
14	Periyakumpurikki Tank	204	-- do --
15	Pettawa Tank	230	-- do --
16	Pulikande Tank	225	-- do --
17	Ullai kulam	215	-- do --
18	Neelapani kulam*	1140	-- do --
19	Yan oya Inicut	1400	Central Irrigation Dept
20	Paramadu Tank	668	-- do --
21	Mahadirul Wewa	1,390	-- do --
22	Morawewa**	4,041	-- do --
23	Wan ela	1,576	-- do --

*This tank is undertaken for rehabilitation with an estimate for Rs 121 Million under the PEACE Project, aided by the JBIC.

** This tank is undertaken for rehabilitation with an estimate for Rs 78 Million under the PEACE Project aided by the JBIC

Table 9-2 Tanks to be rehabilitated in Batticaloa district by 2010

No	Name of Tank	Acearage	Agency for ownership and Maintenance
1	Araisuddakaddu Kulam	310	Provincial Irrigation Dept
2	Mathuranheeni Kulam	402	-- do --
3	Kirrimachchi Odai Kulam	242	-- do --
4	Tharavai Kulam	200	-- do --
5	Pulugunewa Tank *	4850	-- do --
6	Kadukkmunai Tank**	2760	-- do --
7	Adachchal Tank	325	-- do --
8	Periyakulam (Periya Perabon)	340	-- do --
9	Periyakulam (Palugamana)	300	-- do --
10	Periyakulam Mahiloor	350	-- do --
11	Sevakapattu	300	-- do --
12	Mahiladitiore Kulam	200	-- do --
13	Weligahakandiya Tank	339	Central Irrigation Dept NEPC
14	Kithulwewa Tank	800	-- do --
15	Wadamunai Tank	378	-- do --
16	Kaddumuthine Tank	800	-- do --
17	Punanai Anicut	1550	-- do --
18	Thumbankeerni Tank	670	-- do --

* This tank is undertaken for rehabilitation with an estimate for Rs 138 million under the PEACE Project, aided by the JBIC.

**This tank is undertaken for rehabilitation with an estimate for Rs 25.31 Million under the NECORD Project.

Wedamunai Tank is undertaken for rehabilitation with an estimate for Rs 12.6 Million under the NECORD Project

Table 9-3 Tanks to be rehabilitated in Ampara district by 2010

1	Chadayathalawa Tank
2	Sagamam Tank
3	Vammiadi Tank
4	Rufus Kulam
5	Kanchikudichcharu Tank
6	Naulla Tank
7	Semani Kulam
8	Thonikkal Anicut
9	Beropola Tank
10	Thalapitiyaoya Anicut

Chadayantalawe Tank is undertaken for rehabilitation with an estimate for Rs 18.0 million under the NISCORD Project.

Berapola Tank is undertaken for rehabilitation with an estimate for Rs 10.0 Million under the PEACE Project.

11	Namal Oya	3,952	Central; Irrigation Dept
12	Palan Oya	3,307	----do ----
13	Elegal Oya	2,196	----do ----
14	Ambalam Oya	3,391	----do ----
15	Pannalagama Tank	650	----do ----
16	Temprobiya Tank	430	----do ----
17	Lahugala Tank	1339	----do ----
18	Lahugala Tank	371	----do ----
19	Panama Tank	445	----do ----
20	Radeka Tank	998	----do ----
21	Wil Oya Anicut	650	----do ----
22	Valathapiti Anicut	909	----do ----
23	Navalar Anicut off Heda Oya	3952	----do ----

Map 9-1 Irrigation Plan - 2010

Phase II is termed as Transitional Phase with a period of ground work and infrastructure necessary for implementing longer term development of Irrigation Sector activities that will be implemented. This phase will be commenced from 2010 to 2020 (See Map 9-2)

Table 9-4 Tanks to be rehabilitated in Trincomalee district by 2020

	Name of Tank	Acerage	Agency for Ownership and maintenance
1	Kanthatail Tank	13,577	Central Irrigation Dept
2	Vandarasan Kulam	10,250	-- do --
3	Allai extention scheme	17,413	-- do --

Table 9-5 Tanks to be rehabilitated in Batticaloa district by 2020

	Name of Tank	Acerage	Agency for Ownership and maintenance
1	Unnichchai Tank	12,757	Control Irrigation Dept
2	Region Tank	9,752	-- do --
3	Vakaneri Tank	8,500	-- do --
4	Navaleri Tank	17,505	-- do --

This tank is undertaken for rehabilitation partly with an estimate for Rs 200 Million under the NEIAP Phase II Programme aided by World Bank.

Table 9-6 Tanks to be rehabilitated in Ampara district by 2020

	Name of Tank	Acerage	Agency for Ownership and maintenance
1	Senanayake Samudra	128,338	Central Irrigation Dept
2	Karavaku Drainage		---- do ----
3	Construction Scheme of Heda Oya Tank	10,000(New)	----- do -----

Phase II is termed as Steady Development Phase with activities to achieve long term development (regional) towards the final goal of achieving high economic and living standards environmental sustainability and socio political stability. During this phase the groundwork needs assessment, surveying and leveling of sites, where needed, organizing FOs and strengthening them and the development of the institutional mechanisms towards water management is vital.

Major programmes of new infrastructure development such as roads, bridges, culverts, etc are proposed to accelerate the development of irrigation sector. It should also provide facilities to support commercial, industrial, fisheries and agricultural (irrigation) development. For example, development of Batticaloa lagoon can be one of such major proposed project in this period. This project alone will create significant development potential for irrigation facilities for agricultural lands including paddy and highland crops along the lagoon. Development activities on inland fishing, coastal tourism and flood control etc. and development of land in the adjoining areas are targeted.

A strategy for rapid employment generation during the rehabilitation of irrigation schemes, construction of new irrigation tank, etc along with the agricultural programmes will be focused in this phase for steady development promotion of high value crops under an intensive and commercially oriented agricultural system will be initiated with the breakaway from subsistence agriculture. As a reset, yield of 60 – 65 MT / ha could be achieved in the high potential major irrigation schemes with the practices of the management, farmers participatory approaches etc. Cropping intensity could also be increased leading to higher productivity,

high income to farmers with high standard of living. The human resource availability and skills needed for paddy cultivation and other highland crop cultivation could be improved and expanded to suit the needs of a dynamic market economy. Development of Irrigation sector in the Eastern Region should consider on a priority based the issues of social harmony as there are Sinhalese , Tamils and Muslims predominantly in both Trincomalee and Ampara Districts and Tamils and Muslims predominantly in the Batticaloa District.. Environmental stability is a must while developing on sectors in the irrigation with a balanced sub regional development effectively using local resources in the Eastern Province. For example; no exploitation of fauna and flora and forest reserves should be allowed in the catchment areas related and rivers flowing into irrigation tanks, etc. It is also necessary to manage the water in the tanks to protect fishes, birds and animals in the region. This will create an opportunity to develop tourism around the irrigation schemes especially, for the tourists who are interested nature and bird watching.

Water supply for domestic and industrial purposes from the irrigation systems to the farmers and other residents in and around the schemes is possible. For example; Unnichchai tank, Kantalai tank, Senanayake Samudra etc, could be utilized for such purposes. This is expected to facilitate healthy and productive lifestyles for people, development of agro – based industries (farming tools, repair and service to farmer related machinery and equipment, packaging etc.) leading to value addition and enhancement of employment opportunities.

Map 9-2 Irrigation Plan 2020

10 CHAPTER 10 : FISHERIES AND AQUACULTURE DEVELOPMENT PLAN (FADP)

10.1 Objective

The main objective of this development plan is to increase the contribution towards the regional GDP through a sustainable and responsible fisheries and aquaculture industry. Value addition to the products of the capture fisheries and aquaculture sectors will also be an objective of the FADP. The planned increase in GDP ensures that increase will not be at the cost of the natural ecosystems. in the region. The developmental proposal will undoubtedly play a role in social and intercultural harmony in the district through the assistance of all sectors.

10.2 Specific objectives

Poverty alleviation especially among the coastal fishery community and coastal dwellers supporting towards food security in the region

Improved and sustainable coastal environment

Resource conservation.

Coastal fishery/aquaculture related eco-tourism development

It is proposed to achieve the above objectives through specific programmes. High emphasis will be placed on increasing coastal fish production by at least 5 % per year and to increase job opportunities for fishermen and fisher widows (war victims). It is proposed to increase fish production by establishing loan or other viable assistance programmes to rehabilitate fishing vessels and gear, that were either destroyed or damaged during the conflict.. Preferably the deep-sea activities along with anchorages and harbours should be developed. The post harvest loss prevention and processing such as filleting, smoking, drying, freezing, canning etc would also be considered to improve the livelihood of fisher families in the eastern province.

10.3 Future fisheries production

10.3.1 Sea Fish Production

Sea fish production in the province is currently around 35,500 tons. In recent years it has shown a strong increasing trend. The province's share of the total national catch is showing an increasing trend again (but has not yet recovered to former highs). The most of the growth has taken place in Trincomalee District (currently 14,500 tons), while production in Batticaloa and Ampara Districts is lower (10,800 and 10,100 tons, respectively). Trincomalee and Ampara is having a higher number of deep sea vessels than in Batticaloa. Batticaloa possesses undisturbed fishing grounds. With the increase in the deep sea fishing vessels, an increase in the fish production at around 5% per year is expected, contributing towards a 2.5% increase in GDP. Two thirds of all district production is landed at the towns and gravets of the Trincomalee district. The largest part of the catch is landed at Manmunai followed by Valachchenai in Batticaloa District.

Species composition data for Batticaloa District shows an interesting pattern of change within the sea fishery. In recent years large pelagics has become the dominant fishery, out performing both small pelagics and table fish. Skipjack is the most important species in the large pelagics catch, followed by shark and yellow fin tuna, and finally seer fish. Small pelagics show a rationalization in the fishery with baitfish caught by drift gillnetting becoming dominant over beach seining. The trend for table fish shows a sharp decline for rockfish, while trevally has generally increased. Lobster production is quite depressed.

According to the present figures there is an average of 6.7% increase in the fish landings over the years. If the fishermen are assisted by providing loans to buy the inboard engine boats, the deep sea fishing will be enhanced resulting in an elevated production for a short period (2005 to 2020). Beyond 2020 it is difficult predict an increase but is expected to stabilize at a lower level with a contribution to GDP by around 2.5 % annually which may extend up to 2030.

10.3.2 Lagoon Fish Production

Lagoon fish production is not usually presented as a distinct category in Sri Lankan fish production statistics, and it is not clear if lagoon catch is included in marine fish production or in inland and aquaculture production

A long-term time series for lagoon finfish catch from Batticaloa District showed a fluctuating trend. The 400 ton average during 1980s declined to a near total collapse resulting an average of 21 tons during early 1990s (the latter possibly is due to the civil war), followed by a strong surge to 2,000 tons. Subsequently, a partial decline to below 1,000 tons (again probably due to war) was observed, followed by a recovery. Last year a decline was observed perhaps due to pollution.

A second – and shorter - time series for Batticaloa District shows a similar pattern during recent years. The data however also includes crab and shrimp catches. crab production has generally remained stable over the last five years, while shrimp production resembles the finfish pattern to some extent.

Lagoon fish production in Ampara District shows a trend of four-fold increase over the last decade, with a slight decline in the late 1990s.

10.4 Current national and regional fisheries management policies

10.4.1 Batticaloa Lagoon Management Regulations

Fishing regulations for Batticaloa Lagoon were gazetted on 15 January 2001. However, these new regulations have not yet been passed by the parliament. They are planned be incorporated in the SAM site management plan. As the regulations are not based on sufficient scientific research, they may need to be amended in the future on the basis of substantial fisheries research results becoming available.

10.4.2 Enforcement of Fishing Laws and Regulations

Fishing regulations are formulated and applied at national level. There are no special local regulations, other than for the Batticaloa Lagoon. Minimum size limits have only been specified for lobster (3.5 cm carapace length), and it is prohibited to catch berried females. Other regulations include bans on light fishing at night, purse seining and using fixed gillnets in lagoon channels.

Boats over 34 ft length must be legally registered to fish. In Trincomalee, all boats are registered, but smaller boats do not possess a license. Though regulations require fishers to purchase fishing permits, only about 25% have applied. However, up to now no one has been granted a license, and fishers continue to fish without their licenses. Fishing permits are valid only for one year.

10.4.3 Community Based Fisheries Management

FADP should encourage fishing communities participating in fisheries management. There are provisions in the Fisheries and Aquatic Resources Act of 1996 to establish Fisheries Management Areas and fisheries management authorities composed of representatives of fishers' committees. There is significant enthusiasm and political will within GOSL to implement community based fisheries management (CBFM). It is intended that FCS will have a role to play in fisheries management. This will be mainly to inform the DFEO of infractions. FCSs will however not be involved in setting fishing regulations, according to the Assistant Director DFEO for Batticaloa District. It is not completely clear if fishers will have any active or executive role in fisheries management.

There are some attempts by FCSs to set their own fisheries management regulations. For example, some FCSs have banned the use of high pressure PETROMAX kerosene lamps for fishing, and only allow low intensity unpressurized lamps(Sool lantern) to be

used for fishing. Rakawa Lagoon in southern Sri Lanka is sometimes cited as a successful example of fishers' participation in management (although this opinion is not shared by all).

10.5 Proposed development activities for fisheries

A set of initiatives for investment is presented below, grouped into appropriate categories. The initiatives were identified by the district level consultation meetings held in 2003, and by the field visits in 2003 (which reflect discussions held with interested parties in fisheries sector in the three districts). A modular approach has been adopted, having each initiative as a stand-alone, and can be implemented at any time. It is acknowledged that not all initiatives may be implemented in the near future due to security or other constraints.

In presenting these initiatives, an attempt has been made to formulate a comprehensive program (ie, 'solution') for fisheries development and management for the next 25 years. It is assumed that development of the sector will be primarily market driven and not simply a response to new or innovative technology.

10.5.1 Investments in Fish Harvesting and Wholesale Auctioning

The approach taken is to target the lower income group of fishers. The strategy is to provide initiatives which will not impose undue financial burdens on this income group which cannot be met through returns from their fishing activity. Increase in income and escape from excessive debt (and implicit poverty traps) are goals of the initiatives.

10.5.1.1 Loan Programs for Boats, Motors and Fishing Gear

There is a clear need for provision of loans to small scale sea and lagoon fishers to buy fishing boats (FRP day boats), outboard motors and fishing gear at normal bank interest rates. The design of the financing programs should ensure that there is a high rate of loan recovery.

The use of fish attracting devices (FADs) to increase the catch rate of large yellowfin tuna (and other valuable large pelagic fish species) should be tested. This approach has proved successful elsewhere (Philippines, Mauritius) and would allow artisanal fishers to supply the high priced Japanese sashimi market. It found to be successful, the project should introduce the method of FAD fishing for tuna to the Eastern province. FADs do present some risk of over harvesting. Therefore FAD installation should be carried out in phases, with simultaneous careful monitoring of catch rates, fish length frequency and stock abundance in order to avoid excessive fishing mortality (man made causes), stock depletion and uneconomic over-investment.

10.5.1.2 Fish Stocking

Opportunities exist for stocking freshwater fish and prawns in the southern basin of Batticaloa Lagoon (which is almost entirely freshwater) and in tanks throughout the three districts. This would serve to increase the abundance of high priced fish and allow freshwater fishers to realize larger catches and higher income. NAQDA has an ongoing program to stock major and seasonal tanks with *Cyprinus carpio*, rohu and catla. At this juncture we expect the breeding center must be in place at suitable location to supply needed fry and fingerling for the freshwater fishers to increase production with out harming the existing stocks. One such breeding center will be placed in three districts Unichani in Batticaloa, Periyakalappu in Ampara and Kanthalai in Trincomalee.

10.5.1.3 Fishermen Training Centers

Fishermen Training centers should be established at each major fish landing. The assistant director fisheries should be responsible for giving training courses and demonstrations to fishers of new fishing methods (such as tuna fishing at FADs for example) and improved on-board handling of fish. Training should also include awareness building about the negative effects of destructive fishing methods

such as dynamiting on the fish stocks, coral environment and the income of fishers. The Fishermen Training Centers should be used as a permanent forum for the dissemination of new technologies and stock management measures among fishers, and the discussion of issues related to the fishing industry and livelihood.

10.5.1.4 Fishing Community Centers/ Fishermen Co-operatives and Auction Halls

Social and economic facilities should be established at all important fish landings. This should include, as appropriate, auction halls, net repair pavilions, net and outboard engine storage lockers, engine repair shops, and FCS offices. The facilities will require water supply, electricity, and toilets. The provision of auction halls is considered a crucial factor for facilitating the transition from contracted fish sale to free auction sale. The free auction system is considered the only system by which fishers will be able to obtain the highest possible market price for their catch, and which would allow them to service their loan repayments without undue hardship and at the same time accumulate capital which will increase their standard of living.

10.5.1.5 Development Options Considered for Investment

The focus of the development plan is poverty alleviation. Accordingly it was considered appropriate to focus on development of a semi-industrial offshore fleet (ie, multi-day boats). It was also considered appropriate to provide loans to fishers through the existing *mudalali* credit network or independently, as this would perpetuate the contract fish sales system, and maintain a high rate of indebtedness among fishers with little prospect of attaining financial solvency.

10.5.2 Investments in the Post-harvest Sector

Fish processing and marketing is generally well organized in Sri Lanka by a centralized group of wholesalers, or *mudalali* based in Colombo. Locally based *mudalalis* also operate within this system, and are linked in various ways to the Colombo *mudalalis*. There would not appear to be any need for the project to intervene in the established system of processing and marketing. However, the evident lack of investment in certain post-harvest facilities suggests that opportunities may exist for new entrants (locally based) into the post-harvest sector in the province. Some FADP investment funds may therefore be cautiously earmarked for larger scale investments in the post-harvest sector, focusing narrowly on initiatives that would be crucial for creating improved processing and marketing conditions supportive of the production sectors.

10.5.2.1 Ice Plants and Ice Machines

The functioning production capacity for ice within the province is currently inadequate to meet demand. Accordingly investment in new ice plants, rehabilitation of existing non-functioning ice plants (also the CFC ice cold room in Batticaloa), and purchase of smaller ice making machines (flake ice is the preferred type of ice) appears to be essential, in a number of locations in the three districts (See Map 10-1).

10.5.2.2 Chill Rooms

There is a need to provide chill rooms in a number of locations in the three districts to allow fishers and traders to store un-marketed catches of small pelagics for one or two days. Situations arise during the high fishing season when there are excess bumper catches and insufficient number of traders or transport trucks to handle the large volume. The chill rooms would even out the supply and demand volumes, ensure that fish prices remain as buoyant as possible, and that wastage of fish due to rotting is minimized.

10.5.2.3 Specialty Fish Transport Trucks

The transport of large quantities of fish out of the province is carried out by road. Conventional 7 ton freight trucks are widely used to

transport standard 50 kg wooden crates of small pelagics. However, specialty trucks (refrigerated and/or insulated) to carry high priced finfish (tuna, seerfish) and shellfish (lobster, shrimp) are required to ensure that product quality remains high. Most of the specialty fish trucks in the region come from Colombo. A scheme for the private sector to purchase specialty fish trucks is essential.

10.5.2.4 Tuna Processing Plant

Given the level of current catches and potential catches of yellowfin tuna and skipjack in the province, it seems very likely that at one or two tuna processing plants would be required. This would provide much needed local processing facilities for the small-scale and multi-day boat tuna fisheries. The plants would also be of high strategic development significance for the fisheries sector of the province. Currently almost all tuna caught in the province is transported to Colombo for processing and export. The benefits of adding value to the raw material is therefore lost to the province, and is realized in Colombo instead.

Raw material could be sourced from OBM, day boats and multi-day boats at various landing sites in the province. The main product of the plants would be cooked and frozen tuna loins, which require labor intensive preparation (thus creating new jobs) and relatively modest capital investment. The loins could be exported to canneries elsewhere (ie, Thailand). Export can be done in refrigerated containers directly from the new commercial berth at Trincomalee Harbor. Good locations for plants are at Cod Bay (Trincomalee town) and the Valachchenai fishing port (large buildings which could be refurbished and used for tuna long lining already exist at both locations). The plants could also produce flake ice for sale to the fishers (See Map 10-1).

10.5.2.5 Option for canning of fish and fishery products

The option for to can the fish in the eastern region is also considered a higher degree opportunity where the trolling and beach seining takes over a huge catch in a day during certain days which cannot be pumped to the market for the sale as fresh fish. The profit is always with value addition used to happen outside the fishing potential areas of East. Therefore this must be considered via this project to motivate private sector to venture into this. The canning of different variety can also be considered such as canning with brine solution, tomato sauce, soya oil etc.

10.5.3 Investments in Infrastructure and Input Services for Fisheries

The civil war has resulted in substantial destruction of fisheries infrastructure and the project needs to carefully weigh the costs and benefits of reconstruction. In view of the focus on low income groups and poverty alleviation, large and expensive schemes which might benefit mainly larger capital investment would not be highly appropriate during the initial phase of the FADP. However, during latter phases such projects should be brought in.

10.5.3.1 Harbor and Anchorage Improvement and Rehabilitation

Opportunities may exist in the province for investments to improve fish harbors and anchorages. There is certainly a need for safe anchorages during the rough seas months (December to March) for day boats. However, full harbor facilities would appear to be most suitable for multi-day boats. The opportunities for investments in fish harbors and anchorages will be analyzed more fully by the fisheries harbor design. The places where this should be considered are Pallameenmadu, Punnikuddah, Kalkuddah, Vaharai, Kaluwernkerny, Kallar, Ontharchimadam, Palaiyadi thona, Thriukovil, Kalmunai Tamil division, Kalmunai Div 1, Thirukaddaloor, Sally, Trincomalee Number 10. This should include the issue of completion of the Saintamaruthu anchorage (ie, removal of the sand bar and permanent opening of the entrance) (See Map 10-1)

10.5.3.2 Access Roads

Opportunities exist in some places for improvement of lanes and roads to fish landings. These consists of three types:

Short lanes running from a paved public road to the landing beach (50 to 100 m in length), such as at Arugam Bay (Ampara District).

Access roads (1 to 5 km long) running from a paved public road to the landing beach, such as at Irrakkakandi (Trincomalee District).

The parking and loading area at fish landing site.

Road and parking lot improvement would range from simple grading to full paving, depending on conditions and degree of use. The paving option is expensive, but might be justified if the value of the catch is high. Roads that allow fishers to gain access to the sea during the dry months when the bar mouth of lagoons is closed also need to be considered. The options for road improvement will be analyzed in detail by the rural infrastructure engineer.

10.5.3.3 Permanent Opening of Lagoon Entrance to Sea

Complete or partial closure of the entrance to the lagoons in the province has a number of negative impacts: reduced tidal flushing, reduced fish stock abundance, poor access to safe anchorage. Marine engineering works to maintain open access and/or water exchange between the sea and lagoon would appear to be an effective - and undoubtedly expensive - solution. Various options could be considered, including breakwaters, dredging, cutting new artificial channels, and culverts.

10.5.3.4 Control of Beach Erosion

Erosion threatens some sections of the coastline of the province, placing fishing communities, fishing infrastructure and roads in jeopardy. In Trincomalee District, priority areas are beaches at Trincomalee town, Kinniya and Matur. Effective options to control erosion are various types of breakwaters, which are generally expensive.

10.6 Aquaculture Production Systems

10.6.1 Aquaculture Resources

Of the aquatic species propagated in hatcheries in Sri Lanka, only tiger shrimp PL are currently used in aquaculture along the coast of Eastern Province. Shrimp PL are sourced from hatcheries outside the province (Chilaw and Puttalam). Water crab used in mud crab fattening operations are caught from wild stocks (See Map 10-2).

10.6.2 Shrimp Farms

Semi-intensive shrimp farming is practiced in the province. Ponds are built at the edge of lagoon, partly excavated, and surrounded by a high bund. Water is pumped in from the lagoon, and waste water is released back into the lagoon without treatment. Only one species (tiger shrimp) is cultured. Shrimp postlarvae (PL) for stocking are sourced from hatcheries outside the province. Shrimp are fed with commercial pellets. Water is treated with dolomite and calcium to prevent acidification. Tea seed cake is used to kill predators in the ponds. Either one or two crops are grown per year depending on location.

Map 10-1 Fisheries Plan - 2010

Average pond size has not been determined by the fisheries authorities. One shrimp farm visited near Batticaloa town had 5 ponds with a total area of 6 acres (= 2.43 ha). This would give an average pond area of about 0.5 ha. This farm received its shrimp PL for stocking from a hatchery at Negombo. The farm operated on a 4 month cycle, with two crops per year. The shrimp are grown out to 25-30 gm size. The total harvest is about 2,560 kg per annum. This would represent an average yield of 526 kg per ha per crop.

Water exchange (15% three times per week) is carried out when the shrimp grow to near harvest size. Only a few shrimp farms use paddlewheel aerators. Most rely on water exchange to alleviate poor water quality conditions due to low oxygen and waste buildup. When shrimp are seen jumping at the surface, it indicates that dissolved oxygen is low and the water is exchanged. This has proved to be sufficient to prevent mortality problems.

There is no treatment of the effluent from shrimp ponds. It is released directly back into the lagoons. Shrimp farmers believe the effluent will not pollute the lagoon because shrimp and fish can live in the same water in the ponds.

10.6.3 Crab Fattening

A profitable aquaculture business which has developed relatively recently is fattening of large mud crab. Crab fattening is carried out in lagoons, in cages which are fully submerged resting on the bottom at 4-5 ft depth. Typically, water crabs (crabs which have just molted) are held in the cages for about one month, and fed heavily on raw fish (fish offal, sardines, skate). The muscle tissue inside the shell increases rapidly in mass and fills out the new shell. The crabs are then sold to mudalalis who transport them to Colombo for export.

In Batticaloa District, there are currently a total of 25 persons doing crab fattening. Some 15 people do crab fattening in Batticaloa Lagoon: 5 persons at Manchanthoduvai (who have been doing it for three years) and 10 persons at Palameenmadu near the lagoon mouth. There are also 10 persons doing crab fattening in the entrance channel to Valaichchenai Lagoon near Nagachivanthivu.

Cages vary in size and construction materials. The largest cages measure 2 m x 3.5 m x 0.7 m high (= 4.9 m³), while the smallest cages are 1 m x 0.6 m x 0.6 m high (0.36 m³). The framework was metal pipes, metal rods or wooden poles (the latter have a shorter working life). The mesh consisted of metal fencing wire covered with plastic film, or multifilament synthetic fish net material.

All crab collectors in the Kinniya area sell to a single crab fattener, who buys only large water crabs. Some 55-60 water crabs (mixed male and female) are stocked per cage. Cage dimensions are 3 m x 2 m x 0.8 m high (= 4.8 m³), giving stocking rates of 11.5-12.5 crabs per m³ of cage volume, or 9.2 crabs per m² of cage floor area. The average weight of stocked water crab is 500 g.² In weight terms, the stocking rates are 5.7-6.3 kg per m³, and 4.6-5.0 kg per m². The feed is skate and other low priced fish, given three times per week. At the time of harvest, there is only a small weight gain (25-50 gm), but the entire water volume in the carapace is replaced by crab meat.

At Batticaloa Lagoon, 800 g water crabs cost Rs 150 each. They are stocked 50 crabs per cage (6 ft x 8 ft x 2 ft high), and fed 5 kg of low value fish per day. They are harvested after 25 days, when each crab weighs 850-900 g, and sell for Rs 500 per kg. A gross profit of about Rs 300 per kg is realized. Feed costs Rs 50 per 5 kg.

The feed application rate was expressed as 0.5 kg of feed per kg of crab per day in one operation. At another location, feeding was at a rate of 10-20% body weight per day (ie, 27.5-30 kg of crab in a cage require between 2.8 and 5.5 kg of feed per day).

The crab fattening operation at Irrakkakandi was not very successful because the crabs were only held for one week before harvesting. The operation at Kinniya is very profitable.

Water quality conditions in Batticaloa Lagoon at Manchanthoduvai are very poor, with large mats of green algae floating at the surface (and in the water column), Dead water hyacinth is also present. Crab cages become covered with the plant material. The water has a bad odor, and has a high turbidity due to phytoplankton. The crabs stocked for fattening were large, with a carapace width of about 15+ cm. The crabs are fed heavily with skipjack and seer fish heads. Uneaten food probably adds to the water pollution, as does crab excreta. NAQDA is promoting crab fattening in Batticaloa Lagoon by providing 12 free cages per year and technical advice. Demand for cages is much higher, and a program to supply credit to buy cages is needed. There is no association for crab fatteners at present (See Map 10-3)..

10.6.4 Mussel Culture

The trials conducted for mussel culture in Batticaloa lagoon did not show satisfactory results, mainly because they were carried out during the wrong season for spat fall.

Map 10-2 Aquaculture - 2030

Map 10-3 Fisheries Plan - 2030

10.7 Investments in Aquaculture

Virtually the full gamut of tropical coastal aquaculture systems that are found elsewhere in the world are candidates for introduction in the province. As the FADP focus is on poverty alleviation, aquaculture systems which meet the criteria of small or moderate investments and low risk were selected. In some cases, trials would have to be conducted before widespread dissemination is possible in order to fine tune the technology and operational economics for local conditions. Some institutional support to NAQDA and other agencies would be necessary for R&D, dissemination and technical extension work.

10.7.1 Loan and Credit Programs for Aquaculture Schemes

As for the capture fisheries, appropriately designed loan and credit schemes would be required to allow low income borrowers to enter into productive activity.

10.7.2 Crab Fattening

This production system is growing in popularity in the province and is appropriate for inclusion in the project activities. Loans would be required to purchase cages, water crabs for fattening, food (fish offal) and lagoon canoes. Profit margins are robust and debt servicing should not be a major problem. Opportunities exist for increasing the longevity of cages through the use of more resistant materials (plastic webbing and pipes), and this could further increase profits over the long term.

10.7.3 Seaweed Culture

Low cost culture system for *Eucheuma* and *Gracilaria* have been used successfully elsewhere (Philippines, Zanzibar, Mozambique) to generate substantial employment and income for coastal communities (women in particular), and also contribute to export earnings. Opportunities for seaweed culture should be explored.

10.7.4 Oyster and Mussel Culture

Bivalve culture is a potential income generating activity in various environments in the province (Trincomalee Bay, Tambalagam Bay, Batticaloa Lagoon and other lagoons). Successful oyster culture is being carried out elsewhere in Sri Lanka (ie, at Moratuwa south of Colombo). Stocks of wild oysters and mussels exist in the province, and are only moderately harvested due to low market price. It is expected that adequate spat falls occur which could be used as seed. Various culture methods need to be tested in the province. Development of markets (ie, tourist hotels, export) would be required to make profitable culture feasible. This might be accomplished by first stimulating sales to tourist outlets using supplies collected from wild mussel and oyster beds in Trincomalee Bay and elsewhere. Once a strong market demand develops, supply from culture operations should be possible.

10.7.5 Brush Parks in Lagoons

The brush park is a method widely used throughout the world in lagoons, lakes, and rivers to aggregate fish. It consists of placing piles of brush, upright bamboo stakes or other wood furnish into shallow lagoons in the configuration of a large rectangular, square or circular brush field. Fish are attracted into the brush park and find shelter and large quantities of food (attached periphyton). The brush park acts both as a FAD (in the short term) and a biological production enhancement system (in the long term). Several brush parks (kottu) were seen in use in Batticaloa Lagoon. Designs for modified brush parks are available which result in a large increase in biological production, rather than simple aggregation. The brush parks are surrounded by blocking nets (thick multifilament twine, 0.5 inch stretched mesh size) and are stocked with fingerlings of appropriate species. No feeding is usually done, and fish growth is based on grazing of periphyton growing on the submerged brush.

The system can result in improvement in water quality as nutrients (nitrogen and phosphorus) are taken up in large quantity by attached periphyton, which are in turn used by cultured fish inside the brush park as food. Conflict with the open water fishery is reduced by the blocking net, which prevents the brush park from acting as a fish aggregator. Trials of modified brush parks would need to be conducted in the lagoons of the province before widespread dissemination. Issues related to maximum area of individual brush park allotments, system for allocation of brush park allotments, and brush park zoning, and furnish supply would need to be addressed. In Batticaloa Lagoon (as well as some other lagoons) strategic siting of brush park allotments could have a marked beneficial impact on water quality through partial removal of excess nutrients originating from agricultural run-off, sewage disposal and shrimp farm effluent.

10.7.6 Floating Cage Culture in Tanks

Opportunities exist for floating cage culture in some of the deeper tanks. Suitable species are tilapia and Thai pangasius catfish. Trials would be need to be conducted first, and demonstration units set up in several tanks. Costs for this type of aquaculture are moderate, and within the reach of low income individuals. It is successfully practiced in reservoirs and rivers elsewhere in Asia (ie, Philippines, Indonesia, Cambodia, Vietnam, China) and a large amount of technical information is available.

10.7.7 Shrimp Hatchery

The shrimp farms situated along the shoreline of Batticaloa and Valachchenai Lagoons currently source their shrimp post larvae (PL) for stocking from a shrimp hatchery on the west coast (Udappu near Puttalam, Chilaw, Negombo). There is a need to construct a local shrimp hatchery. This might reduce costs, ensure a more reliable supply and minimize the risk of disease transfer from the west coast. The hatchery should be privately owned and operated.

10.7.8 Finfish Hatchery

Fingerlings of freshwater fish species for stocking tanks are presently sourced from two breeding stations (Dambulla and Udawalawe) outside the province. The supply of fingerlings is often not adequate to meet the current level of demand in the province. A more efficient approach to meet the increased demand proposed under the project would be to establish one or more hatcheries in the province, possibly one per district. These hatcheries should be owned and operated by the private sector, or by the fishermen co-operative society and charge market prices for fingerlings. Competition between the hatcheries should be encouraged to maintain prices at the lowest economic level. A variety of species should be bred, including tilapia, snakeheads and carps (*Cyprinus carpio*) for freshwater stocking, and mullets, sea bass and *Etropulus* for lagoon stocking. Freshwater prawn (*Macrobrachium rosenbergii*) should also be considered for hatchery propagation.

10.7.9 Shrimp Farm Effluent Treatment Systems

Discharge of untreated shrimp pond effluent into Batticaloa and Valachchenai Lagoons is unacceptable from an environmental perspective, and may also serve to rapidly spread disease from one pond to another as ponds source their water from the lagoon. Treatment of pond effluent, either on an individual or a unified basis, is required. Individual treatment would require converting one production pond at each shrimp farm into a treatment pond. A unified system might consist of a bund, which runs along the shoreline between the shrimp ponds and the open water of the lagoon, and acts as an elongate treatment canal. In either case, the efficiency of the treatment would be increased by using the treatment pond or canal for bivalve and/or seaweed culture, and/or installation of small brush parks for fish production. This would allow substantial cost recovery, possibly with a net profit from the treatment system.

10.8 Development proposals in fisheries and aquaculture sector

Project concept Major components or Activities of the Project	Fisheries Infrastructure Improvement Project						
	<ul style="list-style-type: none"> Activity 1: Rehabilitation of the damaged 10 tons ice plant, machinery(equipments, furniture) along with fish storage , processing unit at Rest house road, Kalmunai. Activity 2: Rehabilitation of the Cey nor boat yard, icefactory and cold storage and processing unit at Kaluwankerny Activity 3: Rehabilitation of cold storage, fish processing unit and 5 tons ice plant at Batticaloa, Lake Road II, Sinnauppodai of CFC's. Activity 4: Increase the fish production through rehabilitation of deep sea gears and vessels (IBM's) along with construction of anchorages. Activity 5 : Issue of self employment loan for fisher women and fisher widows to begin or to enhance her/his employment to rehabilitate their lives. <p>The above five activities should start immediately within the first phase of the plan (recovery phase)</p> <ul style="list-style-type: none"> Activity 6: Establish breeding centers at brackish water and fresh water location to supply fry and fingerlings to natural water bodies which are not having enough stocks. <p>This activity will star by 2008 and can extended up to 2011 within the transition phase plan</p> <ul style="list-style-type: none"> Activity 7 : Increase the fish production from off shore, deep sea along with the training in different aspects at fisheries training institutes 						
Target/ Beneficiary groups	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7
Objectives	Lagoon, coastal, pelagic, off shore deep-sea fishermen get benefited by the cold storage, ice plants and processing units		Pond based fisher families, lagoon based fisher families.		Fishermen (youths), fisher women who are not having job and their job was affected by the unsettled poltical clmate.		
	Fishermen will be able to get ice at a reasonable price and to keep the fish at good quality The fishermen or the fishermen co-operative society can organize the transportation of good quality fish to fish out side market to elevate their income/socio economic status to a considerable level. The fish production will increase to elevate the GDP and to increase the contribution to national economy via value added products export and raw fin fish and shell fish.		Rural upliftment and poverty alleviation of fishermen and low-income farmers through establishment of fish breeding centers, improve farming and improving nutritional status with the availability of cheap animal protein. Creating awareness among stakeholders regarding the need for breeding stations, freshwater, brackish water to supply disease free stocks to the region and as a measure to over come the overexploitations.		Increase fish production in the coastal and inland areas to carry out sustainable fisheries. Improve living standards of affected fishing families by war. Generating employment opportunities based on fish catch and by catch in post harvest handling and fish meal production. Removing mal nutrition among general public of the province by providing cheap animal protein rich in essential amino acids. Provide suitable awareness programmes to utilize the assistances properly I a well managed fashion, as like fisheries co-management.		
Justification	10 ton ice plant at Kalmunai Rest house road, Kalmunai muslim area, Kallady and Kaluwankerny in Batticaloa were damaged during 1990. At Kalmunai ice plant will be rehabilitated under NECORD, the need for ice to fishermen and fish traders are high in the region. In Kalmunai greater part of the fish catch from IBM's used to be transported to Colombo every day. The IBM and OBM's are high in number at Kalmunai at present. Therefore the rehabilitation and reconstruction of damaged ice plant at Kalmunai is vital for the fishing industry.		The fishermen based on inland fisheries fond a huge set back since the people are unemployed and the agriculture activities become stagnated as like off shore, deep sea and coastal fisheries. Therefore the people gone for fishing from the ponds and lagoon where they permitted for fishing without considering sustainable fishery. There are not much fish left in the wild ecosystems for to fish therefore there is a scarcity of cheap animal protein in those areas. It necessitates stocking of those ponds and parts of lagoon to supply protein rich day to diet.		Nearly more than 500 students have completed the courses at the fisheries training institute in fishing gear technology, engine repairs and FRP maintenances from 1994. The training division at Navalady housed in the center of the project area so it will train the people from the three districts with out any problem. The training institute has got a training vessel which would have cost around Rs. 7 million rupees through BIRRP of NORAD is at Negambo and this can be brought to Navalady center to train the students and fishermen in the area where they will engage in fishing for future. The institute has got enough trained staffs to train the students. This institute was built in Palameenmadu and was completely damaged during 1990 and then with the rehabilitation of the building at Navaladdy the institute is running the very minimal courses due to lack of equipments, instruments and it needs further assistance to revive back to the condition prior to 1990.		
	In Batticaloa there was an ice production facility along with processing unit and fish marketing and another similar facilities was available at Kaluwankerny. The existence of processing unit at Kallady Batticaloa provided job opportunities for 50 young girls in processing and post harvest handling of fish in addition to the youths, they involved in transportation and loading. Where as in Kaluwankerny, Batticaloa provided job opportunities for 35 young girls and 10 youths in the same manner as above. At present fishermen and stakeholders are finding it very difficult to store fish and fish products due to						

the non-availability of ice in larger quantities.

Youths engaged in fishing industry are in increasing number with out avenues to go for it, if these will be implemented a proportion of unemployed youths will get employment. Fish production will increase, since at present the fishermen limit their catch to the extent of the ice, which they possess onboard.

The canoes, OBM's, IBM's are landed wherever the fishermen find the site for landing since the anchorage or harbour facilities is not available within the eastern coastal stretch. If the infrastructure developed via this assistance will assist the needy to improve the production and to increases the contribution to the GDP by 2.5% from fisheries sector.

Expected come and Benefits	Provision of ice to the fisherfolks and needy people of the surrounding area at lower cost in needed quantities without shortages. Improved quality of fish caught at the fishlanding sites to the marketing sites and finally to the consumers. Employment of a sector of women and the youths in the area to work in the processing plants, ice production along with marketing outlets. Increase in the income of fishermen for the produce they extracted from the fish landing sites. Increase in the fish catch with the assisted IBM's and OBM's.	Production of fingerling, fry at lower cost to stock the freshwater ponds/tanks or the lagoon	Fishermen /youths of fisher families trained at the fisheries training institute in areas of fisheries navigation, seamanship, fishing gear maintenance, fiber reinforced plastic boat and engine repairs, live saving, refrigerator repairs, electrical work at boats, use of advanced techniques such as fish finders, use of echo sounders, satellite navigation etc. Fisherwomen will also be trained in the postharvest loss prevention since the assistances is for to increase the fish production. Subsequently fishermen will get a big catch regularly then they need to prepare maldivian fish, jadi fish or any such value added products. For this the training of fisher women in needed avenues are vital at this period of time.
Duration	2005 - 2008	2006 - 2010	2007 – 2030
Main stake holders of the project	Ministry of fisheries and aquatic resources development, Ministry of rehabilitation	NARA, NAQDA	NARA, NAQDA, Ministry of fisheries and aquatic resources development
Recommended mode of implementation	Government Assistance,	Community participation, Project planning unit	Project planning unit

11 CHAPTER 11 : LIVESTOCK DEVELOPMENT PLAN (LDP)

11.1 General Objective

The key objective of livestock sector development plan is to strengthen the economy by increasing the productivity in the livestock sector by transforming the present subsistence livestock sector into a market based commercial production leading to

- food security
- poverty alleviation
- increased production
- income and employment generation for a prosperous rural peasantry.

11.2 Specific objectives

To increase the livestock sector contribution to the regional GDP by 6.5, 5.0 and 3.0 during the three phases of this physical planning exercise; 2005 to 2015, 2016 to 2025 and 2026 to 2035, respectively.

Making use of competitive and comparative advantage of the rural resource base.

Increasing farm returns to livestock keepers by improving the productivity of livestock and poultry.

Provide necessary infrastructure facilities, which is vital for production and marketing of livestock produce.

To introduce the value addition to diversify the livestock sector in the province.

Ensure a competitive industry structure for milk processing; animal feed milling and meat processing.

To promote extensive management of cattle for meat and intensive management for milk production

To promote controlled penning for goat farming for meat and milk production in the province.

Creation of rural employment both directly engaged in livestock production, as well as indirectly in the servicing of the sector, supplying inputs to it and marketing its produce.

Organize the livestock farmers into Producers Cooperatives, and similar Farmer Organizations for collective marketing of farm produce and enhancement of farmer returns.

11.3 Livestock development strategy

11.3.1 Restoration of milk production of neat cattle and buffalo.

At present the average neat cattle and buffalo milk production in the Eastern province are 1.25 and 1.71 l/day. If we assume that all the breeds in the province are indigenous (but in reality certain percentage of animals are crossbreeds, some are improved pure breeds) under good management conditions they should yield 2 and 4 l/day. Lack of management practices (specially feeding), inadequacy of veterinary services, inbreeding, poor marketing facilities and low price for milk are the main causes for, low productivity of indigenous animals. Livestock development proposals for the periods of 2010 and 2030 are given in Map 11-1 and Map 11-2. Following have to be fulfilled to achieve the above

- a) **Pasture and fodder development in the grazing lands:** Identified grazing lands have to be surveyed and handed over to the Farmer Organizations and encourage them to establish improved pasture and fodder species. **Based on the land use pattern**, suitable places with respect to districts are given below.

- **Ampara District:** Bintermapattu, Wewagampattu North and Wewagampattu.

- **Batticaloa District :** Korlai Pattu North, Korlaipattu, Eravurpattu and Manmunai West.
- **Trincomalle District :** Seruwila, Kinniya, Gomarangadawela and Thampalagamam

b) **Promoting the existing veterinary and Artificial Insemination (AI) facilities:**

Establishment of a veterinary office for each divisional secretariat will bring down the mortality rate, increase the services to the livestock farmers and facilitate AI to a great extent. Eventually this would help to create a boost in the livestock production.

c) **Renovation of road network:** Renovation and strengthening of road network to facilitate collection and marketing of milk.

d) **Strengthen the existing milk chilling centers**

Strengthen the existing milk chilling centers and provide support services to ensure the smooth functioning of the chilling centers. For all existing chilling centers a generator must be provided to cope up with frequent power failure.

e) **Establishment of new chilling centers:** New chilling centers will be established in Trincomalee: Thambalakamam, Padavisripura, Kinniya, Muthur and Palaththadichchenai

11.3.2 Increasing Productivity:

Increasing the productivity of indigenous livestock by upgrading them to recommended levels of tropical and temperate blood levels in respect to the system of management.

- Neat cattle upgrading with
 - i. Sahiwal : Expected yield improvement - first generation (F1) 1.25 l/day – 3.5 l/day ; - after complete upgrading 1.25 – 6.0 l/day.
 - ii. Jersey 50% blood level under intensive system of management - Indigenous X Jersey – Expected yield – 6 l/day
 - iii. Friesian 50% blood level under intensive system of management – upgraded indigenous (Sahiwal) – expected yield – 6 l/day.

All the animals could be upgraded to dairy purpose, because farmers in this area require animals for multi purposes viz. milk, meat and draft. Resulting only a proportion of the animals could be improved into dairy animals.

- Goat: Upgrading of indigenous goats with Jamnapari and Boer. It is envisaged that at the initial stage goat development programme will concentrate only on meat production. At the later stage milk production will be brought into the breeding programme.

- i. Expected meat production (Indigenous X Jamnapari) – from 10kg to 25kg /animal (carcass weight).

- ii. Expected meat production (Indigenous X Boer) – from 10kg to 40kg /animal

- Poultry: As far as broilers and layers are concern, the production could be improved by strengthening the existing hatcheries at Kallady and Uppuvely and strengthening the mash factory at Sittandy and establishing new mash factory to produce not only poultry mash but also cattle feed and goat meal.
- In addition, cold storage facilities are required to store the surplus egg and poultry meat while it is marketed.

11.3.3 Ensure water availability

Renovation of minor and major tanks to ensure drinking water availability to the livestock especially during dry seasons.

11.3.4 Maximize resource utilization

Efficient utilization of marginal lands to establish factories, industries and other livestock related buildings. Use of indigenous stock as foundation stock for the production of improved breeds. Use of surplus grains and agricultural by-

products as ingredients for mash factories. Use of unemployed men and women for livestock related activities and provide employment opportunity for them

11.3.5 Awareness programmes

Awareness programmes to introduce the benefits of value addition and dissemination of technology of value addition. Start with small-scale units and expand to large-scale production. Provide marketing facilities and marketing technology to facilitate the sale of products.

11.3.6 Infrastructure facilities

By providing essential infrastructure facilities, private entrepreneurs and NGOs will be encouraged to invest on milk processing industries, meat processing industries and feed mills.

11.4 Current National and regional policies

11.4.1 National Policy

The national policy on livestock development is to mobilize resources to enhance the nutrition by breeding mainly cattle, buffaloes, poultry, goats and swine and by developing industries, to increase contribution to the national economy to increase saving of foreign exchange and foreign income earnings, to breed animals of high production capacity and to increase production of animal feed.

11.4.2 Regional Policy

Increase the buying price of milk

Accept and introduce breeding programmes for beef production in Batticaloa district.

11.5 Development Projects in Livestock Sector

11.5.1 Recovery phase

11.5.1.1 Strengthening of existing infrastructure facilities related to livestock production

1. Construction of veterinary offices

It was proposed to construct one veterinary office for each divisional secretariat. According to the current situation additional veterinary offices required for the districts of Batticaloa, Ampara and Trincomalee are 10, 13 and 7 respectively.

Employment opportunity 180 (High, middle and low level category)

2. **Supply of veterinary surgical equipments** including castrators, furniture and artificial insemination equipments to the veterinary offices

3. **Supply of Motor Cycles to the veterinary surgeons and the extension officers**

4. **Strengthening the Livestock breeders** Co-op societies in each district at least five Organizations in each district (building, furniture, milk testing equipment etc).

5. **Providing standby generators to each milk – chilling centre**

6 **Renovation of interior roads and strengthening of road network to facilitate milk collection and marketing of livestock products.**

7 **Renovation of minor and major tanks that will fulfill the water requirement of livestock and livestock related activities.**

8 **Pasture and fodder development in grazing lands.**

Strengthening of the feed mill at standee.

11.5.2 Transitional phase

In the transitional phase, emphasis will be given to exploit the restored infrastructure facilities and production of livestock and poultry in the recovery phase. This action has been taken in three aspects viz, upgrading of livestock Especially, goat and sheep through better availability of breeding materials of male and female animals, provide facilities to value and add the raw products of the livestock mainly milk; and try to produce poultry and livestock feed using the local agricultural products, so that it will reduce the cost of production and save foreign exchange.

Establishment of livestock units for cattle and goat, at least one at each district. Aim of this unit is to issue – breeding materials of cattle and goat to the livestock farmers, which in turn will promote the production potential of the existing livestock and employment opportunity to the unemployed people in the area. Breed selection will be done bearing in mind the needs of the farmers in the respective place. Suggested places

Batticalos district: Illupadichchenai (Goat) and Vellaveli (Cattle)

Trincomalee: Thampalakamam (Cattle) Seruvila (Goat)

Ampara: Pottuvil (Cattle) Sammanthurai (Goat)

Employment Opportunity, Direct employment around 200

Indirect employment around 1000

Establishment of milk processing unit. Objective of this project is to enhance the keeping quality of milk and also to avoid economic losses to farmers; for manufacturing of various milk products, to make it available for domestic market. Suggested places:

Batticaloa district. Compared to the three districts in the Eastern province around 60% of the milk is produced in this district.

Estimated Cost: 30M (1000 lit processing / day) (Expected products pasteurized milk, Cream, butter, ghee and yoghurt, ice cream, chocolate etc).

Employment: Direct employment 50; Indirect – 1000

Establishment of a feed mill to produce poultry, cattle and goat ration.

At present in the poultry production around 70% of the total cost production accounted for feed cost. The main reason for it is about 90% of the raw materials is imported eg. Maize, fish meal etc. Sri Lanka being an agricultural country and being an Island, there is no need to rely on foreign countries for maize, fish meal etc. Suggested Places.

Batticaloa and Ampara **Note:** In Batticaloa district, One mash factory is existing but it has to be upgraded to produce high quality ration.

11.5.3 Steady development phase

In this phase action has to be taken to strengthen the already established facilities and extend the facilities as per requirement. In addition settling up of the following are suggested:

Artificial insemination center

Veterinary investigation center

Nation livestock development board farm

Livestock training center

Animal husbandry school

Map 11-1 Livestock Plan - 2010.

Map 11-2 Livestock Plan - 2030

12 CHAPTER 12: TOURISM AND INDUSTRIAL DEVELOPMENT PLAN (TIDP)

12.1 Tourism

As with the other provinces in Sri Lanka, Tourism plays an important part in the economic life of Eastern Province providing income, employment and expanding business opportunities. The tourist industry is very wide ranging in the services and facilities it requires and provides employment across all sectors of the population.

Apart from conventional forms of tourism, eco-tourism is now fast gaining in popularity, worldwide. Eco-tourism is for tourists, who wish to enjoy the beauty of nature and environment of the place or country. Tour operators and investors are looking at Sri Lanka to cater to the increasing number of tourists interested in eco-tourism. Sri Lanka especially its Eastern part has tremendous potential for eco-tourism due to the variety of natural attractions it has to offer. At present, tourists seem to prefer to visit wild and remote parts of the island.

According to the Revised Coastal Zone Management Plan, Sri Lanka 2003, there are 17, archaeological, historical, religious and cultural sites within the coastal zone of Ampara District, 11 Sites in Batticaloa District and 14 sites in Trincomalee district. Eastern Province has a large number of attractive places but not much attention has been given for developing these places for tourism purposes.

A large number of tourists are also interested in purchasing art work, handicraft, costume accessories, and souvenirs but the Eastern Province has not developed marketing facilities for these items.

Health tourism is not a new phenomenon for Sri Lanka. Sri Lanka has gained a reputation for providing high quality indigenous health and health care services using local herbal products. The Eastern Province has its own traditional system for such health services and can expect greater demand for these services from tourists in the future. However, at present, such facilities for traditional indigenous healthcare has not been promoted or marketed as tourist service and therefore needs to be developed in the future.

Before the civil unrest there were many proposals for the establishment of tourist resorts in the Eastern Province, specially in Arugam bay, Kalmunai beach, Batticaloa, Kalkuda/Pasikudah bay. There were also proposals to improve the tourist infrastructure at Kinniya Hot Springs, Red Rock and Kokkilai lagoon. Due to the civil unrest, the above proposals could not be implemented as planned. Therefore, there is very little variety in the type of accommodation on offer to serve the diverse requirement.

In order for the tourism industry to function effectively strong tourism supporting services and facilities such as travel and tour agencies, tour guides, tourist information centers and manpower training are necessary. As far as Eastern Province is concerned there is no effective and comprehensive support service. With regard to the information, although Eastern Province is rich in attractive tourist sites, facilities in terms of signboards, tourist information centers, good roads to sites, and other information and services are inadequate in main cities or at tourist sites.

Some tourist "front liners" including taxi drivers, tourist bus guides and staff at key transportation gateways are not well informed about tourist attractions. At some sites such as Pasikuda, Nilaweli, and Kinniya hot springs, there are still fairly adequate facilities for tourists but a critical mass is needed to further improve services. Currently there are also problems of access to the Eastern Province (tourist destinations) due to poor road conditions and erosion damage.

12.1.1 Recommended strategies and action projects

Start a programme for marketing and promoting tourism in Eastern Province under the aegis of the Provincial Council.

Develop tourist products aimed at export and diversifying the tourism base. (The principal tourism development proposals have been based on an analysis of the resource and market strength/weakness and development potential of Eastern Province).

Develop a plan to rehabilitate and upgrade the existing resort along the Eastern Coast with infrastructure and recreational facilities.

Introduce a zonal approach to tourism development in the province.

Coordinate with the private sector to promote the Eastern Province as a tourist destination with tourist facilities and services.

Develop eco-tourism and agro tourism opportunities in forestry reserves and other green areas.

Introduce health care tourism, combining with indigenous and ayurvedic medical centers.

Apart from the traditional attractions of the sea bathing, surfing and water skating, introduce and encourage scuba diving and whale watching.

Identify shipwrecks in the Eastern coast and facilitate interested persons, such as divers, treasure hunters, historians and tourists to visit such places.

Promote diversification of accommodation modes.

Provide training programmes, and support information for tourist "front line" workers

Coordinate with other relevant authorities and agencies to ensure that all major tourist and cultural attractions are provided with high quality and well maintained facilities. Eg. Archaeological monuments and site with the Ministry of Cultural and Tourism and Dept. of Archaeology.

Architectural buildings and scenic site with Urban Development Authority + Ceylon Tourist Board and Coast Conservation Department.

Religious and Cultural places and sites - Ministry of Cultural and Tourism, National Physical Planning Department.

Establish permanent museums and exhibitions of the special features of the Eastern Province.

The tourism potential sites and the development areas are shown in the Map 12-1.

Action projects

Arugambay and Pasikuda : Develop as tourist area specially for skating, swimming and water sports.

Kalkudha : Develop and upgrade the area as a public picnic and bathing area.

Nilaveli : Develop as a holiday resort for local and foreign tourists.

Kalmunai Beach : Improve and provide more tourist information, improve facilities in hotels in the area and introduce more activities in collaboration with with private sector.

Batticaloa : Conserve and maintain Dutch Fort and Batticaloa Fort introducing comprehensive guidelines and regulations.

Trincomalee : Prepare a tourist package for Trincomalee town including following important sites:

- Thirukoneswarm Kovil
- Fort Fredrick
- Memorial column (Swamy Rock) Trincomalee harbour.
- Ship wrecks
- Floating dock wreck.

Kalladi beach - Develop as a recreational area.

Vakerai sand split and lagoon - Develop for recreation purpose and eco tourism.

Trincomalee marble beach - Develop as a recreational area.

Nilaweli beach - Develop as a recreational area.

Trincomalee, Batticaloa, Valachchanai - Establish tourist information centers and permanent exhibitions of the special features in the area.

Map 12-1 : Tourism Plan 2030

12.2 Industrial Development Plan

12.2.1 Introduction

Considering the resource base of the Eastern Province, the industrial sector has high potential for development. Specific features such as natural harbour, availability of mineral sand, forest reserves of the region can be utilized for the development of industries in a sustainable manner. The present industrial situation can be characterized by size and type of industry as follows,

- Large Industries
- Small and medium industries
- Service oriented industries

Despite the adverse industrial environment some major industries continued their operation in the region. These industries operated in the region mainly utilizing the natural harbor facility in Trincomalee. A flour mill, which supplies flour to the whole country, two cement manufacturing plants using clinker as raw material and a mineral sand processing facility have been in operation in the vicinity of the Trincomalee harbour. A sugar industry, which provided employment to more than 4000 farmers in Kantale is closed now. In Batticaloa district, a paper manufacturing industry with a capacity of 35,000 MT per year and three garment industries are operating with limited capacity. In Ampara, a sugar industry at Hingurana and tile manufacturing industry are in operation.

Small and medium industrial activities have been carried out in the region in a major way. Since some of the products of the region has recognized as quality products, demand for such products are high. For example sarongs of Kaththankudi, bricks of Ampara, curd of Tambalakamam, cashew of Eravur. In addition to these industries, more than 200 rice mills are in operation, most of them are in Ampara district.

Tourism is the major service oriented industry that has tremendous potential in the region. Nilaveli in Trincomalee, Pasikkudah in Batticaloa and Arugam Bay in Ampara are world famous for sun and sand tourism. Number of sanctuaries and national parks are situated in the region including Lagugala, Kumana, Gal Oya, Sagamam, Kudumbigala attract and promote eco tourism. With the on going peace process, the tourism industry is showing signs of revival in the region. Both local and foreign tourists visit the beaches and nature reserves but the facilities available to cater them are limited. Tourism areas have been developed in ad hoc manner, without proper spatial planning. Arugam Bay area is a classic example of this. Even some of the hotels have been constructed without considering the basic design criteria such as ventilation and sanitary facilities.

12.2.2 Objectives

- To improve the regional economy and the living standards of the people
- To utilize the natural resources and human resources in the region
- To create more employment opportunities for the local people.
- To promote value addition activities of agricultural and fisheries and aquaculture products
- To improve the efficiency of the existing industries
- To promote Eastern Province as a world tourist destination

To promote non-farm activities in rural areas to enhance economic growth in rural areas

12.2.3 Specific Objectives

- To increase industrial output by 20%
- To increase tourist arrivals to 100,000 by the end of the plan
- To develop the Trincomalee port as industrial and recreational port
- To set up an industrial township in Trincomalee Industrial and port related development area.
- To develop manufacturing industries based on value added agricultural products in Ampara agro based development area and Batticaloa fisheries and tourism related development area.
- To develop manufacturing industries of based on value added aquacultural and livestock products in Batticaloa fisheries and tourism related development area.
- To recommence the operation of closed industries and improve the capacity utilization of existing industries in the region
- To study the resource potential of industrial development

12.2.4 Industrial Development Strategy

The industrial development strategy for the Eastern province has been prepared on the basis of resources available in the province and future development arising from the implementation of the physical plan. The strategies set forth in the physical planning framework, will be implemented during the Recovery, Transitional and Steady Development phases of the plan.

Phase 1: Recovery phase

The strategy for the recovery phase will focus on the present issues in the industrial sector. The issues related to the existing industries in the region, immediate infrastructure needs of industries and incentives needed, will be addressed by the strategy during this phase. This will serve as the base for other development envisaged during the other phases of the plan.

A detailed study will be carried out in order to identify the potential and constraints in the development of industrial sector. The outcome of the study can be used for defining strategies and plans projects for implementation.

- Tourist promotion activities along the coastal belt with increasing private sector participation.
- Reactivating of the mineral based industries with processing plants within close proximity to the harbour.

Setting up small and medium industries as agro processing industries in the production zone.

- Agricultural diversification with greater potential to produce agricultural products for export markets such as maize, gingelly and sunflower. These products must be supported by establishing processing industries in order to meet the demand in export markets.
- Explore the potential for dairy farming and develop dairy industry to help the people to engage in alternative agricultural employment.
- Explore the potential of forest-based industries with a long term plan for the development of forest resources in the district.
- Review the potential for inland fisheries and develop a comprehensive strategy to promote fresh water fishing and processing of fresh water fishing.
- Prepare plans for off shore sand mining
- Setting up industrial estates in each district

Phase II : The transitional phase

The transitional phase will deal with strategies to set up major industrial development activities such as port related industries, value added industries and explore the export opportunities. See Map 12-2.

Port development with considerable expansion of shipping operations and introduction of new economic activities that can make use of the potential of natural harbour such as storage facilities, distribution of goods for international markets and shipping related economic activities

- Water based recreational activities to attract both foreign and local tourists in Batticaloa and Trincomalee.
- Creation of Beach Parks at Pasikuda, Kalkuda and Arugum Bay.

Major industries for processing of mineral sand and manufacture final products at Pulmodai regional centre.

Depending on the capacity of the agricultural, fisheries and livestock production in the region, value added industries need to be set up

Establishment of industrial Township at Kapplaturai in Trincomalee district.

Establishment of Agro-based industrial estate at Ampara.

Phase III : Steady development Phase

The strategy for the Steady development phase mainly concentrate on the sustainable operation of the industries developed in the first two phases.

Map 12-2 Industrial Plan - 2030

13 CHAPTER 13 : SOCIAL INFRASTRUCTURE DEVELOPMENT PLAN (SIDP)

13.1 Education Sector

13.1.1 General Objective:

To provide required educational infrastructure to the people of eastern region in order to increase the level and quality of education.

To develop human resources to meet the future skilled labor requirements for the development of the province and the social development of the younger generation to facilitate the formation of a secure civil society.

13.1.2 Specific Objectives:

To revitalize all aspects of the education system, both formal and non-formal, in the region including pre-school, primary, secondary, tertiary and technical/ vocational training systems and facilities, severely damaged during the conflict.

To establish one primary school for every two square kilometer of land in populated areas, by the year 2020.

To establish one secondary school for every ten square kilometer of land in populated areas by the year 2020.

To establish national schools in 1st order and 2nd order service centers in the province.

To improve the student to teacher ratio up to 20 to 1 by the year 2030.

To improve the level of attainment of education during the period 2004 to 2030.

To establish diversified and modern vocational training institutes at 1st order, 2nd order and 3rd order centers in the province in line with the province's main economic activities.

To upgrade existing higher education institutions to meet the expert and professional needs of the province

To enhance the educational infrastructure to suit the emerging future demand for labour arising from the proposed development activities.

To upgrade existing schools to accommodate increasing student population.

13.1.3 Projected demand for educational services in the Eastern province

The following analysis is based on present and future demand for schools, teachers, and other facilities. There is a sharp increase in the student population, particularly in certain divisions of the Batticaloa district, due to the increase in resettlement and consequent enrollment and attendance in schools. The school facilities should be improved in this district, to meet the additional demand from returnee IDP's. Overall, it is estimated that 59 provincial level schools of all types and 12 national schools should be established to meet the demand for education. The following Table 13.1 summarizes the present and future demand for schools in 2010.

Table 13-1 Present and projected distribution of Schools in by zone and district

District	Zone	Provincial Schools (present)	Provincial Schools	s	National Schools 2020	Total (present)	Total (Projected) 2020
Trincomalee	Trincomalle	71	78	6	08	77	86
	Muthur	123	130	2	03	125	133
	Kantale	68	73	1	01	69	74
	District Total	262	281	9	12	271	293
Batticaloa	Kalkudah	95	100	2	03	97	103
	Batticaloa	136	146	6	09	81	155
	Paddiruppu	80	85	1	00	320	85
	District Total	311	331	9	12	320	343
Ampara	Kalmunai	54	58	3	04	57	58
	Akkaraipattu	90	96	3	04	93	100
	Samanthurai	57	62	1	02	58	64
	Ampara	93	98	1	02	94	100
	Mahaoya	36	38	0	01	36	39
	Dehiattakandi ya	46	52	1	02	47	54
District Total	376	394	9	15	385	409	
Total	949	1008	27	39	976	1047	

Note: The above estimate is made on the data presented in the statistical handbook (2002) of NEP Education department

In addition to schools, another important requirement to meet the educational objectives is the provision of teaching staff. The initial step towards meeting this requirement is to fill up all existing vacancies in the teaching and principle cadres of the schools in the province. There is a severe shortage of staff, particularly in some backward zones such as Muthur, Kalkuda, Paddiruppu, where the teacher deficit is a major problem. In order to improve the student to teacher ratio in the province, the existing vacancies should be filled immediately (at least by 2005).

Table 13-2 Existing and future requirement of staff in Tamil schools in the Eastern Province

Zone		Principals	Teachers	Total
Trincomalee	Required	52	1191	1243
	Available	52	1169	1221
	Deficit	0	-22	-22
Muthur	Required	128	1760	1888
	Available	125	1377	1502
	Deficit	-3	-383	-386
Kantale	Required	8	114	122
	Available	8	94	102
	Deficit	0	-20	-20
Batticaloa	Required	135	2230	2365
	Available	135		2018
	Deficit	0	-212	-212
Kalkuda	Required	92	1306	1398
	Available	92	891	983
	Deficit	0	-415	-415
Paddiruppu	Required	79	1219	1298
	Available	74	1090	1164
	Deficit	-5	-129	-134
Sammanthurai	Required	57	908	965
	Available	58	860	918
	Deficit	1	-48	-47
Kalmunai	Required	57	1462	1519
	Available	54	1406	1460
	Deficit	-3	-56	-59
Akkaraipattu	Required	89	1510	1599
	Available	88	1191	1279
	Deficit	-1	-319	-320
Province	Total deficit	13	1816	1829

In addition, the vacancies for principals and teaching staff in Sinhala schools in Kantale and Mahaoya also need to be filled immediately.

Table 13-3 Existing and future requirement of staff in Sinhala schools in the Eastern Province

Zone		Principals	Teachers	Total
Trincomalee(S)	Required	11	231	242
	Available	11	201	212
	Deficit	0	-30	-30
Kantale(S)	Required	54	769	823
	Available	37	725	762
	Deficit	-17	-44	-61
Ampara	Required	93	1542	1635
	Available	84	1557	1641
	Deficit	-9	15	6
Mahaoya	Required	33	433	466
	Available	33	379	412
	Deficit	0	-54	-54
Province	Deficit	-26	128	-145

A large number of schools in the province have inadequate learning and library facilities and many libraries require reconstruction or new buildings. The shortage of librarians in the schools has been identified as an impediment to the development of library facilities in schools. The Table 13.4 shows the required number of new and renovated library buildings and librarians.

13.1.4 Proposed Education development Strategy

The education development strategy of the eastern region revolves around five main themes or areas of activities as follows. Development proposals for the provision of educational infrastructure is shown in **Error! Reference source not found.**

Investments on rehabilitation and reconstruction of capital stock of the educational system

Improvement of teaching capabilities and establishment of a conducive environment for imparting quality school education.

Provision of support to parents and students to increase enrollment and complete formal education through social support projects.

Establish and improve vocational training centers through enhanced involvement of private sector and NGOs.

Improve the capacity of tertiary educational institutions to foster inter racial harmony and peace building through critical thinking, conflict resolution and development planning.

13.1.5 Current national and regional policies and projects in relation to education sector development

The North Eastern provincial council had prepared a six-year educational development plan for primary and secondary education in 1999. The preparation of the second one is in progress. The main goals of the six-year plan are as follows:

Provide equal and improved educational opportunities for all children belonging to the age group 5-16.

Create improved teaching/learning environment in schools with all necessary infrastructure facilities.

Ensure equitable distribution of required human and financial resources for primary, secondary and tertiary education.

Ensure an effective education administration system in the province.

13.1.6 Spatial Strategy for Location of Educational Institutions

In order to achieve an equitable distribution of schools in the province on the basis of hierarchy, the following proposals were made in the plan.

Establish new primary schools in addition to the existing ones in the settlement areas at the rate of one for every two square kilometer of area.

Locate new secondary schools in settlement areas at the rate of one for every ten square kilometers of area.

Establish new national schools or upgrade secondary schools into national schools in every 1st and 2nd order service centers.

Establish vocational training centers in all 1st, 2nd and 3rd order service centers to cater to the regional needs.

13.1.7 Proposals and Action Projects of Education Sector

Several proposals and action projects have been recommended in order to revive the educational system to optimal level and to meet the demand for education in the region. The main proposals for educational reform and development in the region are follows:

13.1.7.1 Renovation and construction of facilities and buildings for schools

The capital stock of the educational system in the province has been severely damaged or in some cases almost totally destroyed. Approximately 6000 classrooms in about 200 schools sustained varying degrees of damage during the conflict. Additional classrooms, laboratories, libraries and office space, teacher's quarters are required to meet the increasing demand for education. In addition, other support facilities such as water and sanitation facilities are needed to ensure a safe and conducive educational environment for children.

13.1.7.2 School Feeding Program

The special needs of children most affected by conflict require specific interventions. In order to promote them to enroll and continue their formal education in schools, more investments are needed in nutritional projects, and in the purchase of equipment and school materials. Acute poverty and malnutrition has hindered proper attendance and increased school dropouts in the region particularly in uncleared areas. Thus the implementation of school feeding programs have the potential to increase enrollment, decrease dropouts, improve the nutritional status of the children, and alleviate the financial burden of parents.

13.1.7.3 Establishment and rehabilitation of pre- schools in uncleared areas

Nearly a third of the 1500 pre-schools in the province is located in uncleared areas and have been established and managed by NGO's. More than 30,000 children attend these preschools. Most of the existing pre-schools lack proper infrastructure or water and the quality of the teaching is very poor. Thus there is a need for improving pre-school education in the province by providing infrastructure facilities and training for teachers.

13.1.7.4 Establishment of Teacher training centers/community learning centers

There were nearly 12 teacher training centers and 8 community learning centers in the province prior to the war. At present only a few are functioning with limited resources and buildings. Community learning centers at Paddirippu, Dehiattakanadiya, Kantale, Trincomalee, Matur, and Sammanthurai are the major centers that need to be restored with equipment and facilities to serve the non-formal education sector.

Table 13-4 Requirement of school libraries and librarians

Zone	Total No of Schools	No. of Schools Identified for Library	Buildings		Teacher Librarians		
			New	Reno.	Required No.of Teacher Librarian	Nominated by Principals	Vacancies
Trincomalee	78	30	5	11	30	17	14
Muthur	124	31	4	13	31	19	12
Kantalai	69	20	3	5	20	14	6
Kalkudah	97	29	3	9	29	20	9
Batticaloa	142	47	6	17	47	38	9
Paddiruppu	81	24	3	9	24	19	5
Kalmunai	57	28	3	13	28	24	4
Sammanthurai	58	20	2	6	20	11	9
Akkaraipattu	94	35	3	12	35	35	0
Maha Oya	36	11	2	3	11	8	3
Dehiattakandiya	65	19	2	7	19	13	6
Amparai	94	31	5	10	31	22	9
Total	995	325	41	115	325	251	84

13.1.7.5 Establishment of vocational training centers

One of the major areas of investment proposed in the education sector in the province is the establishment and improvement of Vocational Training Centers (VTC) in selected urban and town centers. The following are the main proposals with respect to VTCs in the province.

Renovation and improvement of Hardy Technical Institute - Ampara .

This is an accredited agricultural training center, which has the capacity to provide training for improved agricultural and industrial development technologies for the region. At present it is functioning with inadequate buildings and facilities. In order to expand capacity and accommodate more trainees and courses, the center requires renovations or additional buildings and staff.

Fisheries Training Center in Batticaloa.

The Batticaloa Development area has been proposed as a fisheries and tourism development area in the physical structure plan. It is proposed to establish a modern fisheries training center in the Batticaloa area in order to strengthen the technical capacity of fishermen and related service providers who engage in fisheries related activities in the proposed area. The proposed center will cater to the needs of the entire community.

Shipping Technology Training Center at Trincomalee.

A Shipping Technology Training Institute has been already proposed and some investments have been made. This will be a major vocational training center located out of Colombo. Training will be provided to youth specifically in the mechanical area of shipping at the Port of Trincomalee. This training center is expected to boost the regional economy and create more employment opportunities for youth.

Building Construction, Maintenance and Technology Training Center at Batticaloa

With the acceleration of reconstruction and rehabilitation activities in the region there is a big demand for skilled labor in the building construction industry. Currently, there is a considerable amount of work being undertaken in housing reconstruction and rehabilitation of public institutions, through many donor funded and NGO projects. Thus the establishment of a fully equipped building construction training center at Batticaloa will provide training and skill development in this field for unemployed youth.

Textile and Garment Industry Training Center at Kalmunai

Kalmunai is one of the leading textile trading centers in the province. At present most of the textiles sold locally and nationally are imported. Though there is great potential for manufacturing of clothes and textiles locally not much attention has been paid to

developing this industry. Therefore establishment of local garment industry at Kalmunai will boost the local economy and provide greater employment opportunities for youth who have completed their secondary school education.

13.1.7.6 Restoration and improvement of tertiary education institutions

Although there are three university campuses in the region (EU campus-Trincomalee, Eastern University at Vanadarumulai and South Eastern University at Oluvil) they are not fully equipped with facilities and staff to offer a quality education. Two proposals for improving higher education in the region include, the establishment of a GIS laboratory at the EU Campus at Trincomalee and a Medical College at the Eastern University. Universities could play a major role in the building of civil society and the promotion of inter-ethnic and inter-cultural harmony.

Map 13-1 Educational Infrastructure Plan - 2030

13.2 Health sector

13.2.1 General Objectives

To upgrade and improve and to provide quality health care at all levels with easy access to people.

To foster better management practice in resource management and in providing clinical care

To give more emphasis to maternal and child health care development and health and occupational health needs of the working population.

To make people more health conscious and enable them to adopt healthier life styles.

To develop human resources for health care development that is most relevant to the needs of the region

To facilitate private sector involvement to support and complement state health sector development.

13.2.2 Specific Objectives:

To restore health services in the region to a level on par with the rest of the country by 2007.

To ensure access to all levels of health care; primary, secondary and tertiary care in keeping with the needs of the present and projected population. (Further described below)

To establish a proper referral system in health care delivery through appropriate linking of the three tiers in the health care delivery system by 2010

To ensure that required support facilities for smooth functioning of health delivery and administration system are in place by 2010. This also includes accommodation facilities for health staff, drug storage facilities, adequate safe water supplies, health management information systems, and epidemiological surveillance systems.

To ensure that relevant and required health infrastructure and recommended national health care delivery practices are in place to achieve improved health outcomes such as

- the reduction of maternal mortality, infant and child mortality by 50 % by year 2010 and by 80% by year 2015.
- the reduction of mortality rates due to diarrhoeal diseases by 50 % by year 2010.
- the reduction of malnutrition in under 5 yr children by 50% by year 2010
- the reduction of low birth weight by 30% by year 2010.
- to prevent epidemics of vector borne diseases within the region

To control the spread of HIV infection and keep the prevalence rate below

To strengthen regional facilities for Human Resource development to enhance the quality of all categories of health staff and to provide training that is most appropriate to the needs and demand of the communities by 2005/2006

13.2.3 Development Strategies for Health Sector:

Adoption of Human Resource Development Strategic plan, which emphasizes on regional efforts to improve existing capacities and develop further mechanisms for regular Human Resource Development.

Strengthen Emergency care practices including emergency obstetric care, at all levels of care, according to identified standards for emergency care practices and facilities for each type of hospital.

Provide one District General Hospital to each District and depending on the health care demand, provide 1-2 District Base Hospitals and to provide each divisional secretary area with a divisional hospital(currently institutions named as District hospitals, Peripheral units, rural hospitals will fall into this category). Other primary care level institutions known as Primary medical care units (which will include all the central dispensaries and maternity homes) shall be developed as per the health care need of the locality (See Map 13-2 and Map 13-3.).

All health facilities shall have a Master plan for institution development where space for future expansion will be identified.

Provide optimum level of care facilities to all institutions to enable the functioning of a referral system for health care

Ensure that all hospitals are health promoting and environmentally friendly through the adoption of health promotion programmes and safe hospital waste and sewerage disposal systems and ensuring good quality of water in health facilities and in public water supplies.

Further strengthen the network of primary community health care to enable health promotion and prevention activities. There is a need to reduce the population served by a Public health midwife from its present accepted norm of 3000 to 1,500.

To ensure that the medical officer of Health and his staff, plan and implement suitable programmes for improvement of the level of nutrition at divisional and sub divisional levels in close coordination with other relevant sectors in the locality.

To provide adequate transport facilities to the management and supervisory level staff and to community level staff

To provide selected regional and sub regional /district level special health care units such as a Regional training centre, Public health laboratory, Regional rehabilitation center/s, Cancer care services, Blood bank services, STD/AIDS units, Health Education units, Drug stores, Biomedical Engineering and maintenance units

To adopt a management information system that includes management, financial, clinical performance indicators to foster performance management of the health care delivery system.

13.2.4 Definitions of curative care institutions

Primary medical care unit – has only out patient facilities with limited in emergency treatment care before the patient can be transferred to the next level of care

Divisional hospital – to this category belongs all the peripheral hospitals, which are named as District hospital, Peripheral Unit and Rural hospital. This type of hospital is for primary in patient care. It also has an out patient facility. There are no specialist doctors. Grade medical officers and Assistant Medical Officers man these institutions. Basic laboratory facilities, minor surgical procedures that can be handled by a Grade medical officer and basic Emergency care are given here.

Base hospitals and General hospitals – These are Secondary care hospitals. The Basic specialist doctors are available. Base hospitals are further categorized as type A and type B. Type A hospitals are suitable where the catchment population is large and a higher turnover is expected. Two units of each of the basic specialties (General Medicine, General Surgery, Pediatrics, Gynecology & Obstetrics) will be available in a Type A hospital. Type B will have one unit of each basic specialties and this will cater to the areas with lesser catchment than Type A.

13.2.5 Curative care health institutions for the Eastern province

The table given below is only a rough guide as to how the network of hospitals can be developed. Currently there exists more primary care facilities in a given township area if the divisional secretariat area is considered. This is because the aim is to provide accessible

health care and not merely on population densities. Hence it is difficult to give an exact number of the types of primary health care institutions and secondary care level institutions that need to be placed based only on population.

Also note that the Tertiary care facilities are available through the Teaching hospital at Batticaloa although it is a 2nd order service center. Batticaloa is in a central location in the region. This may have been the reason why the Teaching hospital is located here and not in Trincomalee, which is the 1st order Town. Also a Teaching hospital will have a University attached to it. The Eastern region university being situated in Batticaloa and hence the location of the Teaching hospital is justified.

Table 13-5 Proposed Health Institutions in the Eastern Province

1 st order Service Center	2nd order Service Center	3rd order Service Center	4th order Service Center	5th order Service Center	Village
Primary Medical Care Unit – 1 or more	Primary Medical Care Unit – 1 or more	Primary Medical Care Unit – 1 or more	Primary Medical Care Unit 1 or more	Primary Medical Care Unit – 1 or more	Primary Medical Care Unit - 1
Divisional Hospital – 1 or more	Divisional Hospital – 1 or more	Divisional Hospital – 1 or more	Divisional Hospital – 1 or more		
Tertiary Care hospital/ General hospital - 1	Type A Base Hospital/ General hospital - 1	Type B Base hospital - 1			

Table 13-6 Re-categorized Health Institutions in Batticaloa Health Division

Divisional Secretariat area	Current name and type of institution	New name /proposed institution according to the re-categorization	2020	2030
Manmunai North	RH Palameenama du	Divisional Hospital	Divisional Hospital	Divisional Hospital
	GH Batticaloa	District General Hospital	District General Hospital	District General Hospital
Manmunai Pattu-Arayanpathy	DH Arayanpathy	Divisional Hospital	Divisional Hospital	Divisional Hospital
Manmunai West -Vavunathivu	RH Mandapathady Not functioning	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD & MH Navatkadu	Primary medical care unit	Divisional Hospital	Divisional Hospital
	CD Koddaimunai	Primary medical care unit	Primary medical care unit	Primary medical care unit
	CD Unnichchai Not functioning	Primary medical care unit	Primary medical care unit?	Primary medical care unit
	CD Mahilavedduvan	Primary medical care unit	Primary medical care unit	Primary medical care unit
Kattankudy	DH Kattankaudy	Divisional Hospital	Type B DBH	Type B DBH
Manmunai South - Eruvil Pattu	DH Kaluwanchikudy	Divisional Hospital	Divisional Hospital	Divisional Hospital
	DH PeriyaKallar	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD	Primary	Primary	Primary

	Thuraineelavai	medical care unit	medical care unit	medical care unit
	CD Kalluthavelai	Primary medical care unit	Primary medical care unit	Primary medical care unit
	CD & MH Cheddiyapalam	Primary medical care unit	Primary medical care unit	Primary medical care unit
Manmunai South West	CD & MH Kakkadicholai	Upgrade to Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Thanthimalai - proposed	Primary medical care unit	Primary medical care unit	Primary medical care unit
Porativu pattu -Vellavelly	CD Bakiella-not functioning	New Primary Medical Care unit at Palayativattai	Primary medical care unit	Divisional Hospital
	CD Mandur	Upgrade to Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Palugamam	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
Eravur Town	DH Eravur	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Meerakerni	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
Eravur Pattu	RH Chenkalady	Divisional Hospital	Divisional Hospital	Divisional Hospital
	RH Mavadiyenbu	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Pullumallai	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	New CD Karadiyanaru	Primary medical care unit	Divisional Hospital	New District Base hospital Karadiyanaru Type B
Koralai pattu	DH Valachchanai	Upgrade to District Base Hospital-Type B	District Base Hospital-Type B	District Base Hospital Type A
Koralai pattu South	Primary medical care center-	Primary medical care center	Primary medical care center	Primary medical care center
Koralai pattu Central	Primary medical care center-	Primary medical care center	Primary medical care center	Primary medical care center
Koralai pattu West-Oddamavady	RH Meeravodai Functioning as a CD	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Santhavelly	Upgrade to Divisional Hospital	Divisional Hospital	Divisional Hospital
Koralai pattu North	PU Vakara Not functioning	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Kathiraveli	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	CD Mankerny Not functioning	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit

Table 13-7 Re-categorized Health Institutions in Trincomalee Health Division

Divisional Secretariat area	Current name and type of institution	New name /proposed institution according to the re- categorization	2020	2030
Eachchilampattai (Verugal)	1. CD Eachchilampattai	Primary medical care unit	Primary medical care unit	Divisional hospital
Kuchchaveli	2. PU Pulmodeoi	Divisional Hospital	Divisional Hospital	Divisional Hospital
	3. RH Nilaveli	Divisional Hospital	Divisional Hospital	Divisional Hospital
	4. CD Thiriyai	Primary Health care unit	Divisional Hospital	Divisional Hospital
Seruwila	5. RH Serunuwara	Divisional Hospital	Divisional Hospital	Divisional Hospital
	6. CD & MH Seruwila	Primary Health care unit	Primary Health care unit	Primary Health care unit
Gomarankadawela	7. RH Gomarankadawela	Divisional Hospital	Divisional Hospital	Divisional Hospital
Morawewa	8. CD & MH Mahadivulwewa	Primary Health care unit	Primary Health care unit	Primary Health care unit
	9. CD & MH Morawewa	Primary Health care unit	Primary Health care unit	Primary Health care unit
Thampalakamam	10. PU Thampalakamam	Divisional Hospital	Divisional Hospital	Type B DBH
	11. CD & MH Ganthalawa	Primary Health care unit	Divisional Hospital	Divisional Hospital
	12. CD Mullipothanai	Primary Health care unit	Primary Health care	Primary Health care
Kanthalai	13. BH Kanthalai	District Base Hospital type B	Type B DBH	Type B DBH
	14. CD & MH Wanela	Primary Health care unit	Primary Health care unit	Primary Health care unit
Muthur	15. CD Battukachchiya	Primary Health care unit	Primary Health care unit	Divisional Hospital
	16. DH Muthur	Divisional Hospital	Type B DBH	Type B DBH
	17. CD Kilivetti(RH)	Primary Health care unit	Divisional Hospital	Divisional Hospital
	18. CD Thoppur	Primary Health care unit	Primary Health care unit	Primary Health care unit
Kinniya	19. CD Manalchenai			
	20. CD Sampoor	Primary Health care unit	Primary Health care unit	Primary Health care unit
	21. DH Kinniya	Divisional Hospital	Divisional Hospital	Type B DBH
Padavi Siripura Town & Gravets	22. CD Kachchakodithivu	Primary Health care unit	Primary Health care unit	Primary Health care unit
	23. PU Padavi Siripura	Divisional Hospital	Divisional Hospital	Divisional Hospital
	24. GH Trincomalee	District General Hospital	District General Hospital	District General Hospital
	25. CD China Bay	Primary Health care unit	Primary Health care unit	Primary Health care unit
	26. CD Sampalthivu	Primary Health care unit	Primary Health care unit	Primary Health care unit
	27. CD Selvanayagapuram	Divisional Hospital	Divisional Hospital	Divisional Hospital
	28. CD Kappalthurai (under utilized)	Primary Health care unit at different location		

Table 13-8 Re-categorization of health institutions in Amparai Health division

Divisional Secretariat area	Current name and type of institution	New name /proposed institution according to the re-categorization	2020	2030
Dehiattakandiya	Base Hospital Dehiattakandiya	District Base hospital Type A	District Base hospital Type A	District Base hospital Type A
	Central Dispensary Nawamedagama	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	Central Dispensary Sandunpura	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	Central Dispensary Siripura	Primary Medical Care unit	Divisional Hospital	Divisional Hospital
	Central Dispensary Lihiniyagama	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	Central Dispensary Weheragala	Primary Medical Care unit	Divisional hospital	Divisional Hospital
	Central Dispensary Mawanawella	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	Central Dispensary Kakuluwela	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
Mahaoya	District hospital MahaOya	District Base Hospital Type B	District Base Hospital Type B	District Base Hospital Type B
Padiyatalawa	Peripheral Unit Padiyatalawa	Divisional hospital	Divisional Hospital	Divisional Hospital
Ampara	District General Hospital Amparai	District General Hospital Amparai	District General Hospital Amparai	District General Hospital Amparai
	CD Paragahakele	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital
	CD Namaloya	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital
	CD Ambagahawella	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital
Uhana	CD & MH Senarathpura	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital
	CD Uhana	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	CD Weeragoda	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	CD Mangalagama	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
Damana	Rural Hospital Wadinagala	Divisional hospital	Divisional hospital	Divisional hospital
	RH Thottama	Divisional hospital	Divisional hospital	Divisional hospital
	CD & MH Damana	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital
	CD Muwangala	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	CD Madawalalanda	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	CD Koknahara	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
	CD Pannalgama	Primary Medical Care unit	Primary Medical Care unit	Primary Medical Care unit
Lahugala	RH Lahugala	Divisional hospital	Divisional hospital	Divisional hospital
	CD & MH Panama	Upgrading as Divisional hospital	Divisional hospital	Divisional hospital

Table 13-9 Re-categorization of available health institutions in Kalmunai Health division

Divisional Secretariat area	Current name and type of institution	New name /proposed institution according to the re- categorization	2020	2030
Kalmunai Tamil Division	Base Hospital Kalmunai North	District Base Type B	District Base Type B	District Base Type A
	CD & MH Periyaneelwanai	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	CD Chennaikkudiyaruppu	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
Kalmunai Muslim Division	Base Hospital Ashraff Memorial	District Base Hospital type B	District Base Hospital type B	District Base Hospital type A
	Peripheral Unit Maruthanmunai	Divisional Hospital	Divisional Hospital	Divisional Hospital
	Sainthamaruthu	District Hospital Sainthamaruthu	Divisional Hospital	Divisional Hospital
Karaitivu	Peripheral Unit Karaitivu	Divisional Hospital	Divisional Hospital	Divisional Hospital
	Central Dispensary Mawadippally	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	Ninthavur	District Hospital Ninthavur	Divisional Hospital	Divisional Hospital
Addalachenai	District Hospital Palamunai	Divisional Hospital	Divisional Hospital	Divisional Hospital
	Peripheral Unit Addalachenai	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD & MH Oluvil	Primary Medical care unit	Divisional Hospital	Divisional Hospital
	CD Deegavapiya	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
Akkaraipattu	Base Hospital Akkaraipattu Central	District Base Hospital Type B	District Base Hospital Type B	District Base Hospital Type B
	CD Muhammadiyapuram	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	Alayadivembu	District Hospital Akkaraipattu	Divisional Hospital	Divisional Hospital
Thirrukkovil	District Hospital Thirrukkovil	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Komari	Primary Medical care unit	Primary Medical care unit	Divisional Hospital
	CD Panankadu	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
		Primary Medical care unit Thandyaddi proposed	Primary Medical care unit	Primary Medical care unit
Potuvil	District Hospital Potuvil	District Base Hospital type B	District Base Hospital type B	District Base Hospital type B
	CD Ulla	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
Samanthurai	District Hospital Samanthurai	Divisional Hospital	Divisional Hospital	Divisional Hospital
	Peripheral Unit Central Camp	Divisional Hospital	Divisional Hospital	Divisional Hospital
	CD Mawatta	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
Navithanveli	CD Sorikkalmunai	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
	CD Annamali	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
Irrakamam	CD Irrakkamam	Primary Medical care unit	Primary Medical care unit	Primary Medical care unit
		Primary Medical care unit Neinakadu	Primary Medical care unit Neinakadu	Primary Medical care unit Neinakadu
		Primary Medical care unit- Ilukuchchenai	Primary Medical care unit- Ilukuchchenai	Primary Medical care unit- Ilukuchchenai
	Primary Medical care unit - Alankulam	Primary Medical care unit - Alankulam	Primary Medical care unit - Alankulam	

Map 13-2 Health Infrastructure Plan - 2020

13.2.6 Community health care network

The basis for development of the physical facilities for community health care has been the divisional secretariat areas. Each Health Unit coincides with a Divisional health secretariat area. A Medical Officer of Health (MOH) manages community health services in a Health Unit. A Health unit is further divided into Public Health Inspector areas that may coincide with several Grama Niladhari areas and Public Health Midwife areas, which generally coincide with 1 – 3 Grama Niladhari areas.

The current norm for deciding Public Health Inspector areas is an approximate population of 10,000 – 12,000, which is in accordance with the boundaries of the Grama Niladhari areas pertaining to the population concerned.

The current norm for deciding Public Health Midwife areas is an approximate population of 3000, which is in accordance with the boundaries of Grama Niladhari areas pertaining to that population. The norm of 3000 is being reviewed as some areas with low population density required extensive travel and hence the expected level of community care through home visiting cannot be given.

The physical facilities required for delivery of community health services is given in the Table below.

Table 13-10 Required community health facilities in the Eastern Province

Health Area	Area in terms of accepted administrative areas and boundaries	Type of facility required	Remarks
Health unit / MOH area	Divisional secretariat area	MOH office	Preferably located in an accessible central location in the Div. Sec area. However MOH areas cannot be sometimes established for all the divisional secretariat areas as the population is sometimes very small. The acceptable population range for one MOH area is 50,000 –100,000. This size of population is dispersed across several div. Sec areas. Hence the operational feasibility of one MOH covering a large area too has to be considered.
PHI area	Several Grama Niladhari areas	Office of the PHI	One room office accessible to the public. Can be rented out space in a public/private building.
PHM area	1-3 Grama Niladhari areas	PHM office Accommodation facility for PHM	Should be located in a safe acceptable area that is accessible to the public. Family accommodation for PHM is recommended.
		Ante natal/Child welfare/Family planning clinic buildings	Should be located in a safe acceptable area that is accessible to the public. A clinic building is usually available for 2-3 PHM areas. However if the population density is very low then clinic buildings should be made available in order to improve access for care.

Map 13-3 Health Infrastructure Plan - 2030

14 CHAPTER 14 : PHYSICAL AND ECONOMIC INFRASTRUCTURE DEVELOPMENT PLAN (PEIDP)

14.1 Traffic and Transport Plan

14.1.1 General Objective :

Develop a multi-modal transport system to enhance the functional efficiency and the productivity of the Eastern Province.

14.1.2 Specific Objectives :

To achieve an integrated multi-modal (Road, Rail, Air and Sea) transport system in terms of intra & inter provincial and international linkages to meet the accelerated economic growth.

To upgrade existing road network and ferry services to meet present day mobility standards.

To strength the regional linkages & improve connectivity with the rest of the country.

To develop Trincomalee Port as a major international access point for the North-Eastern part of the Country.

To optimize the functional efficiency in the proposed urban agglomerations using traffic & land use management.

To enhance linkages or connectivity from urban agglomerations to the hinterland.

To optimize the use of existing railway for passenger and freight transport.

To promote air transport and maritime system to enhance tourism and freight transportation.

14.1.3 Issues & Constraints

This section lists the critical issues and constraints that arise from the data analysis. Attention is give to the issues & constraints that have a direct impact on archiving the objectives identified in the Section 14.1.1. Issues that need attention are:

Low road network density within the Province

Low average speeds on internal roads

Poor road condition due to lack of maintenance

Poor directness in travel and excessive travel times between other regions of the country

Potential for higher growth in vehicle ownership levels

Poor access to places of tourists & cultural interests within the region

Slower speed and poor connection in rail service

Underutilization of air transport facilities

14.1.4 Internal Road Network

The road network within the Eastern Province is one of the poorest in Sri Lanka. Only the Uva Province has lesser road density measured in terms of the land area it serves. Road density in the Eastern Province with respect to land area is 0.91 km per square km of land and it is well below the National average of 1.45. Out of the three districts within the Province, Ampara has the least road density (i.e. 0.73 km per square km) followed by Trincomalee (1.04 km per square km) & Batticaloa (1.08 km per square km).

However, the road density measured against the resident population it serves is higher than the National average of 5 km per 1000 persons. The average for the Province is 6.1 km per 1000 persons. Here, the Ampara shows the least density (5.46 km per 1000 persons) followed by Batticaloa (5.5 km per 1000 persons) and Trincomalee (8.25 km per 1000 persons). This can not be considered as satisfactory even though these numbers are above the

National average. From the above, it can be seen that the Ampara district is poorly served by roads as compared to the other two.

In addition to the poor connectivity, majority of road are in poor condition due to lack of maintenance. As a result average speeds on local roads are very low around 15-20 km per hour and in some cases it is even below 10 km per hour. In order to provide a satisfactory service it is necessary to maintain an average of 25-35 km per hour speed for the local roads. As traffic flow would not be a factor for speed reduction at present, by providing proper geometric standards and maintenance practice, desired speeds could be achieved.

If no network expansion is taken place, the road density with respect to the population served would reach the anticipated National average of around 3.3 km per 1000 persons by year 2030. However, this is not at all satisfactory with respect to future mobility of people. In order to achieve satisfactory mobility standards and to reach the National Average with respect to area served it is necessary to increase the road network length by 50% of the present level. Nearly 4500 km of road length should be added to the internal road network. Majority share of these roads could be local roads. It is proposed to increase the road length within the DS divisions that are selected for population agglomerations to a standard of at least 6 km per 1000 persons and 1.25 km per square km.

It is necessary to increase the carriageway width to at least 4.5 m for local roads and reserve space for widening of all A, B, C & D Class roads. As mixed traffic condition is expected within the Province, adequate space for pedestrians and bicycles should be provided in all road links.

14.1.5 National Roads within the Province

At present all major roads leading out of the Province have adequate capacity to handle existing traffic levels. One of the main problems is insufficient space for pedestrians and bicycles, especially within urban and commercial areas. This contributes to the reduction in average travel speeds.

Outside the urban areas, average speeds on National roads are within the acceptable level of 50 km per hr. There are few road links such as A015 and A012 which are badly damaged during the last two decades that can not provide acceptable speed level. All A-class roads must bring up to a level where average speed of 50 km per hour could be provided within the next 5 to 10 years. All B-Class roads must reach a level of 35-40 km per hour average speed. However, these speed levels may not be sufficient for the next 20 to 25 years. Therefore, it is necessary to reserve space for future widening of A & B Class roads to reach at least 80 km per hr and 50 km per hr average speeds respectively.

Present density of A & B Class roads within the Eastern province is below the National average. It is necessary add another 500 km of road to the network of National roads (A & B Class) within the next 25 years. This could be achieved by adding new links or upgrading existing C & D Class roads to A & B standards. At least 50% of the increase should be taken place within the next 10 years to drive the anticipated economic development within the province. There are certain situations where a number of B, C & D Class roads could be combined and improved to provide better connectivity and higher mobility standards. These situations and possible new links are discussed in Section 14.1.10.2.

There are number of ferries in operation within the Province along to the National road network. These ferries bring down the average travel speeds on these A and B Class roads. By 2030 all these ferries should be replaced by bridges. However, at present the traffic levels on some of these roads do not warrant bridges at ferry locations. At least 3-4 ferries must be replaced by bridges within the next 5 to 10 years in order to improve the mobility within the Province.

14.1.6 Connection to Other Regions

Even though the main urban centers are adequately connected to other urban centers of the country through the existing road network inter regional mobility between the Eastern Province and other regions are at a very low level. Even the inter district movements within the Province is also restricted due to longer travel lengths. One of the reasons for poor mobility is that the Eastern Province is further away from the other regions of the country due to geographic situation and access times from other regions are relatively higher compared to the direct distance. For an example travel times from Western & Southern regions are excess of six hours due to the central hills. This isolation due to excessive travel distances and travel times is a prime reason for the slower economic growth in the Eastern Province.

Significant improvements in travel times could not be achieved by improving & widening the existing roads that connect the Eastern Province to other regions. Use of a faster mode of transport such as air transport or make use of a high mobility road network linkages is vital to improve inter- regional movements. At present, demand for inter regional travel to and from the Eastern Province may not warrant any direct high mobility road connections. However, provision for reaching Colombo under six hours should be explored within the next 10 to 15 years.

14.1.7 Connectivity to Tourist Areas

The Eastern province is rich of places of cultural value and scenic beauty that may attract foreign and local tourists. One reason for the less popularity is the scattered nature of this places and poor transport access from main roads. Other main reason is the longer distances and excessive travel times from other regions of the country. Hotels and other tourist facilities are also under developed in the eastern Province. However, it may be possible to increase the tourist attractions by providing enhanced transport connections.

Three different transport solutions are proposed to promote and enhance tourism in the Eastern Province:

- Provide improved road connections to a) Southern coastal tourist areas, b) Kandy & central hills and c) North-Central Province (Anuradhapura & Polonnaruwa).
- Provide improved air transport connections to Ampara, Batticaloa and Trincomalee.
- Create scenic (tourist) routes through the Eastern Province connecting groups of places of interest.

14.1.8 Passenger Transport & Traffic Management

With the development of urban agglomerations there will be a significant increase in urban population. This in turn increases the vehicle ownership levels and traffic flows on roads. In order to avoid traffic congestion and improve road safety two fold approaches need to be taken.

First option is to improve public transport service within the region so that the need for private vehicle usage could be reduced. To achieve this it is necessary to provide an efficient bus route network and a reliable service. In addition improved terminal facilities, bust stop locations and user information system need to be provided.

The second option is to provide improved traffic management measures especially within urban areas. Facilities to pedestrians and bicycles is utmost important in this region. Separate pedestrian and bicycle paths should be provided where ever possible and otherwise all urban roads must have sufficient space for pedestrians and non-motorized vehicles. Advance traffic management measures such as coordinated traffic signals, one-way operations, bus only lanes should be introduced prior to reaching congested levels.

14.1.9 Railway Operation

Out of the three Districts in the Eastern Province only Ampara District is not served by rail. Even though the Province is served by nearly 120 km of rail line, railway is not very popular as a mode of transport at present. Poor and unreliable service is the reason for the lesser demand for railway. Single-track line with limited passing facilities, poor condition of the railway track and outdated mechanical signalling system are the reason for the unreliability and increase in travel time.

The two rail lines has the potential of facilitating freight transportation to and from the Eastern province. Specially the bulk cargo from Trincomalee such as cement & floor, agriculture produces from Batticaloa such as curd & rice could be economically transported by rail. This will reduce the burden on roads due to heavy truck movements.

It is necessary to strengthen the track and improve signal and passing facilities to improve the travel times and reliability. Connection to the Trincomalee harbor and the airport is an added advantage.

14.1.10 Development Proposals

14.1.10.1 Improvement to the Existing Road Network

The existing major roads in Eastern Province, which are in poor condition, (Table 14.1 and See Map 14-1) should be upgraded or improved immediately, before starting any new road construction. The objective is to improve accessibility between main urban centers of the province. Access to the proposed service centers that are not along a main urban corridor would be provided by means of improved access up to a main corridor so that it would discourage ribbon development along the main transport corridors. Under this programme, the following roads have been identified for immediate rehabilitation and improvement.

The Colombo-Trincomalee road (A6) from Habarana to Trincomalee needs to be upgraded to a two-lane highway as soon as possible. A pavement width of seven meters with two meter wide shoulders on either side is recommended for this road section. Depending on the availability of the funds, an asphalt concrete surface (AC) or double bitumen surface treatment (DBST) could be use as the pavement surface. Space for an additional lane in either direction for future widening or a suitable by-pass road should be developed for the section between the Fourth Mile Post Junction to Trincomalee and to locations where township development is expected. The two shoulders could be paved or primed to have a different surface texture so that these shoulders can be used as a facility for bicycles and pedestrians. The shoulders should be separated from the pavement by proper markings on the road. Clearance on either side of the pavement and separation of the bicycles and other slower traffic from the main road stream would improve transport efficiency and increase the service life-time of the road significantly.

This will then improve the link between Colombo and Trincomalee for road based passenger and freight movements. It will also improve accessibility to the Industrial and Port related development area. Upgrading this stretch of road will provide sufficient roadway capacity for the next 10-20 years even if the estimated traffic flow is doubled due to the proposed development activities. In a situation where traffic flow increases significantly beyond the estimated volumes, consideration could be given to linking Trincomalee to the proposed expressway network in Sri Lanka, with suitable access to other growth centers along this corridor.

Table 14-1 Roads to be rehabilitated

Road No	Road Name
A 004	Colombo-Ratnapura Wellawaya -Batticaloa
A 005	Peradeniya-Badulla-Chenkaladi
A 006	Ambepussa-Kurunegala-Trincomalee
A 011	Maradankadawala-Habarana-Thirikkondimadu
A 012	Trincomalee – Anuradhapura – Puttalam
A 015	Batticaloa-Trincomalee
A 027	Ampara – Uhana- Maha Oya
A-101	Ampara - Inginiyagala
B-001	Akkaraipattu - Warapathachenai
B-002	Akkaraipattu - Sangamam
B-010	Allai – Kantalai
B-016	Approach road to Ampara Airport
B-018	Ampilanthurai - Veeramunai
	Approach Road To Batticaloa Railway Station
	Approach Road To Eravur Railway Station
B-031	Arasady - Malkampiddy
B-038	Valachchinai Nanalady Nasivantevu
B-046	Kallady -
B-073	Chadayanthalawa
B-077	Chadayanthalawa
B-092	Deegawapi
B-131	Damana
B-140	Inner Harbour Rd
B-140	Dockyard Rd
B-140	Dutch Point Rd
B-140	Fort Fredrick Rd
B-140	Beach Rd
B-140	Love lane Rd
B-146	Bar Road
B-184	Kalkudah Road
B-185	Kalkudah Valachchinai Road
B-186	Kalmunai -
B-187	Kalmunai -
B-196	Majeed Mawatha
B-250	Lake Road No-1
B-266	Malwatta - Chadayanthalawa
B-298	Munai Street
B-333	Oddamavady - Vahanery
B-337	Old Katankudy Road
B-340	Orr's Hill Circular Rd
B-344	Paddiruppu Vellavelly Road
B-347	Palathoppur –Seruvila
B-350	Pallang Oya - Inginiyagala
B-355	Pottuvil - Kumbukkana
B-374	Pottuvil - Panama
B-375	Power House Rd
B-424	Trincomalee-Nilaveli-Pulmodai
B-433	Urani Road
B-439	Deegawapi
B-440	Uhana - Weeragoda
B-447	Vilgam Vihara Rd
B-541	Thampalagamam - Kinniya
B-542	Lady Manning Drive
B-543	Lloyds Avenue
B-623	Nilaveli Saltern Rd
B-624	Pulmudai-Bogahawewa
B-626	Perkar Rd
	Approach road to admiralty building

14.1.10.2 New road links

A new road link of about 2.0-2.5 km should be introduced between 4th Mile post junction at A006 to Thorankadu near 178 km post on

A012 so that it connects A015 to the road connecting Thorankadu to Alas Garden at Trincomalee-Pulmodai road (B424). This will serve as a ring road to Trincomalee that connects all four transport corridors A15, A6, A12 and B424. This ring road passes at a distance approximately 6-7 km from the Trincomalee city centre and can be served as a boundary to Trincomalee urban area. This facilitates traffic movement from the airport to Nillaweli beach area and Kanniya hot springs. Any traffic from Pulmuddai and Kuchchweli to the Trincomalee harbour could also use this ring road to avoid Trincomalee town.

Road link improvements to connect Ampara to proposed Oluvil harbor and to connect Uva & Southern Provinces.

New road connections to Ampara and Polonnaruwa Districts.

Sakamam – Irakkamam – Malwattai – Dadayanthalawa – Mandur – Paddirippu – Vauunathive

Vauunathive- Karadiyanaru- Thekkanchenai – Welikanda - A major highway (expressway) is proposed for the eastern province, from Ampara to Trincomalee through the interior section of the province via Kardiyan Aru (See Map 14-1). This highway will serve to connect major development areas and existing urban centres through link roads at intersections. This highway would mainly be used as a high-speed traffic corridor and as such no development would be allowed along this road.

Padavi Diripura- Adampane - Gomarankadawala

14.1.10.3 Tourist routes

Tourist route from Ampara to Kuman via Lahugala & Pottuvil which connect the Ampara airport to Arugmabe, Lahugala and Kumana.

Kumana - Okanda – Panama – Arugambe- Lahugala – Hulannuge – Mirahala – Thottama – Damana -Inginiyagala

14.1.10.4 Rail facilities

Upgrade the section of the rail line between Gal-Oya to Trincomalee such that speed restrictions could be eliminated. At present major delays occur between Gal-Oya and Kantalai railway station. Construction of a crossing station/ siding facility at the mid block of this section would halve the delays.

It is proposed to extend the Batticaloa railway line to Ampara via Kalmunai. This will serve the Ampara areas for passenger and freight transport. This link can be further extended up to Pottuvil in the later stage.

Upgrade rail operation to Batticaloa and future extension to South of the region

The railway track within the Eastern Province is a single-track line, supported with wooden sleepers and operating using an outdated mechanical signal system. Due to the poor condition of the railway track, a number of speed restrictions have been imposed. The railway stations that are presently functioning for passenger and freight transport are shown on Map 14-1.and Map 14-2.

The present freight and passenger rail transport system is highly inefficient and unsatisfactory. The train speed is restricted to 24km/h from Gal-Oya to Trincomalee and Batticaloa-Colombo due to poor track conditions.

It is also proposed to upgrade both rail lines such that speed restrictions could be eliminated. New concrete sleepers will be used to improve the rail track and an improved signal system would be installed to improve operation. These improvements would increase the quality of service not only on the Trincomalee line but also on the Northern and Batticaloa lines.

See Map 14-1, Map 14-2 and Map 14-3.. for the phasewise railway line extension.

14.1.10.5 Bridges & Ferries

Construction of a bridge at Kinnia across the lagoon. It is necessary to keep sufficient clearance for the bridge to facilitate naval movements. See Map 14-1, Map 14-2 and Map 14-3..

14.1.10.6 Boat services

Increase capacity, frequency and speed of the boat service from Muttur to Trincomalee. Improvements to Jetties are also necessary.

14.1.10.7 High mobility connections

Colombo – Kurunegala – Dambulla

Kottawa- Ratnapura - Wellawaya

14.1.10.8 Airport development

Development of air transport facilities would lead to improved tourist access to the Eastern Province. As the government has no plans to improve the three airports to the standard of an international airport, the existing airports can only be used for internal flights. The location of all three airports within the proposed development areas facilitates such development. In order to operate as a civil aviation airport the following improvements are needed:

Runway rehabilitation- The existing bituminous surface should be rehabilitated with a new asphalt concrete layer.

Terminal development- A terminal building with user facilities to process passengers should be constructed.

Access road development- The proposed ring road facilitates with access from the airport to the tourist attraction areas would improve the accessibility to the airport. Further, adequate parking facilities should be provided for tourist coaches and taxis.

A terminal building with user facilities to process passengers is needed. The existing bituminous surface need rehabilitation Access road to the airport should be improved. The proposed ring road facilitates the access from the airport to the tourist attraction areas. It is also necessary provide good connection from the China Bay station to the airport. Further, adequate parking facilities should be provided for tourist coaches and taxis. Development of Ampara airport as a regional civil aviation airport with both passenger and freight handling facilities.

14.1.10.9 Marine Route

A maritime navigational route is proposed between the Trincomalee and Oluvil ports. This can be extended to Galle and Colombo if necessary. The proposed route will be used for passenger and freight transport.

14.1.10.10 Contents of Project Concepts for Physical Plan for Eastern Province

Contents of the Proposals	Explanation of the Contents
Project Concept	Rehabilitation & Improvement of Existing Roads Improvements to the existing road infrastructure is essential as the road network will serve as the foundation for all other development projects
Major components or activities of the project :	Major components of the road improvements & rehabilitation project are: Activity 1 - Rehabilitation & Improvement of local roads – Recovery Phase Activity 2 - Improvements to National roads – Recovery Phase Activity 3 - Rehabilitation of National roads – Transition Phase Activity 4 - Rehabilitation of damaged bridges & ferries on National roads – Recovery Phase Activity 5 - Construction of new bridges – Steady Development Phase
Target / Beneficiary Groups	Activity 1 – Rural communities of the region. Especially, children, women & elderly Activity 2 – Urban & Rural communities of the region, business & recreational traffic from other regions Activity 3 - Urban & Rural communities of the region, business & recreational traffic from other regions Activity 4 - Rural communities of the region, especially, children, women & elderly. Business & recreational traffic Activity 5 - Urban & Rural communities of the region, business & recreational traffic from other regions
Objectives	To improve mobility & accessibility of the people in the region and to facilitate the travel between other regions.
Justification	Improving the local road network will help the communities to improve their access to food, markets, education and health facilities. Strengthening the National road links will be helpful to establish business linkages to other regions and also to developing global partnerships
Expected Outcome and benefits	Reduced travel time and vehicle operating costs. It is expected to increase the average travel speeds on local roads to 25-35 km/h from 15-25 km/h at present. Increase in accessibility to rural communities. Improved mobility between other regions. Average speeds on National road links will increase to 40-50 km./h from 25- 40 km/h at present
Other Information such as suitable location, land area required, already identified areas, etc.	Activity 1 - Rehabilitation & improvement of local roads. At least 100km of C & D class roads and 1000km of local roads from each District should be selected for rehabilitation & improvements. This needs an establishment of a road condition database and roads for improvements should be selected based on a proper screening process. In addition to traffic levels, connectivity, accessibility, safety & social equity aspects should be incorporated for the selection of roads. Activity 2 - Improvements to National roads – A015 Trincomalee - Batticaloa road (Trincomalee – Kinnia and Batticaloa-Tirukonnamadu sections as stage one during recovery phase. Reservation required to widen these road links to four-lane condition should be established during the recovery phase and widening could be completed during he steady development phase)

	<p>Trincomalee - Pulmudai road (B424), Kinniya - Thambalagamuwa road (B541) and Allai - Kantale road (B10)</p> <p>Activity 3 - Rehabilitation of National roads – All road links should be widen to two-lane condition (7.0 m carriageway and 2.5 m paved shoulders on either side) with provision for widening up to four lane condition with service roads where necessary, during the steady development phase if required. A006 Ambepussa - Trincomalee road from Habarana to Trincomalee A012 Trincomalee – Anuradhapura- Puttalam (within the province) A015 Trincomalee Batticaloa road (Kalivetti-Muttur section as stage 2 during transition phase, Tirukkonnarnadu-Kilavetti and Muttur-Kinniya sections as stage 3 during steady development phase.)</p> <p>Activity 4 - Rehabilitation of damaged bridges & all ferries on National roads – Recovery Phase Activity 5 - Construction of new bridges (Kinnia & Kilavetti) – Steady Development Phase</p>
Duration	<p>Activity 1 – 2005- 2008 – Recovery Phase Activity 2 – 2005 - 2008 – Recovery Phase Activity 3 – 2006 - 2010 – Transition Phase Activity 4 – 2005 - 2008 – Recovery Phase Activity 5 – 2007 - 2030 – Steady Development Phase</p>
Major stakeholders of the project	<p>Activity 1 – Provincial Road Department Activity 2 – Road Development Authority Activity 3 - Road Development Authority Activity 4 - Road Development Authority Activity 5 - Road Development Authority</p>
Recommended mode of implementation	<p>Activity 1 – Community participation, Government Assistance Activity 2 – Government Assistance Activity 3 – Government Assistance Activity 4 – Government Assistance Activity 5 – Government Assistance</p>
Possible Sources for Financing	<p>Activity 1 – Decentralized budget / Donor funding Activity 2 – Government funding Activity 3 – Donor funding Activity 4 – Government funding Activity 5 – Donor funding</p>

Map 14-1 Transport Plan - 2010

Map 14-2 Transport Plan - 2020

Map 14-3 Transport Plan - 2030

14.2 Water Sector

14.2.1 Objectives

The declared national objectives in the provision of water supply services to the population of the country include:

Providing access to sufficient and safe drinking water to 85% of the population of Sri Lanka by 2010 and to 100% by 2025;

Providing piped water supply to 100% of the urban population by 2010;

The prevailing water supply services in the Eastern Province is so far removed from these targets, that a properly formulated and a realistic plan has to be implemented to reach them.

A realistic plan must have a short term objective, medium term objectives and long term objectives. They should be planned and implemented respectively under the Recovery Phase, Transition Phase and the Stable Development Phase of the proposed Eastern Province Physical Plan.

A short term objective would be to achieve an immediate positive impact on the water supply situation by: restoring existing services to a useable and maintainable condition immediately; developing the services to meet the backlog of new demand including the demands of the returning populations; ensuring that the services, once restored and developed, are affordable, sustained and maintained.

A medium term objective should target the development of the water supply in the Eastern Province to reach the national standards on the indicated time frame.

The planning horizon related to these objectives is based on planning periods of:

Recovery Phase – 6 years from 2005 to 2010

Transition Phase – 5 years from 2011 to 2015

Stable Development Phase - Long Term

The Recovery Phase should also allow for including new and ongoing investment activities according to the Public Investment Program of the Government. The Transition Phase should be aimed at planning and implementing specific projects and the long term period is used for future water demand and investment forecasts and implementation of projects.

14.2.2 Projected demand for Water supply in proposed development areas, sub regional centres and 4th order service centres in the Eastern Province

14.2.2.1 Industrial and Port related development area

This consists of the 1st order service center in the Trincomalee Port City with a projected population by 2030 as 141,000, three 3rd order service centers at Kantalai, Muthur and Kinniya having populations respectively of 88,000, 100,000 and 93,000 by 2030 and a 4th order center, Thambalagama with a population of 90,000 by 2030. The development area will have an estimated population of 512,000 by 2030. The nature of the proposed development requires that the water demand be assessed under the four consumption areas of domestic, institutional, commercial and Industrial respectively for each area. (See Map 14-4).

Based on an average per capita demand of 145 liters per day the average daily demand for domestic water in the Trincomalee Industrial and Port related development area by 2030 would be approximately 75,000 cubic meters

The National Water Supply & Drainage Board estimates the water demand of institutions such as Government Offices, Hospitals, Schools, Religious Places at approximately 10% to 15% of domestic water demand. Commercial demand varies with the area and is normally estimated at between 5% and 10% of domestic demand. In the special circumstances of the guided development envisaged under Industrial and Port related activities, no established norms can be used to make any forecasts. Based on the present demand of industries and shipping in Trincomalee, of about 5% of domestic demand and that of Colombo of around 10%, an estimate of the demand for industrial and port related activities in Trincomalee at full development would be about 8% of domestic demand. Water losses due to wastage and leakage are very significant in production forecasts. This percentage can vary from 25% to 45% of domestic demand.

It is not practicable to make any firm forecasts for water demand for the respective situations at this early stage of the planning process. But based on past experiences of the demand trends in similar situations in the other parts of the country it would be possible to provide indicative assessments to plan for order of magnitude demands. A conservative estimate for the water demand for the year 2030 for the industrial and port related urban agglomeration of Trincomalee would be about 140,000 cubic meters per day.

This water demand may have to be met from the existing supply source of Kantalai Tank to be supplemented from a new source. The Mahaweli River flows north into Koddigar Bay about 10 Km east of Muthur Town. The river flow measurements done at Mannampitiya Bridge shows that the average monthly flow varies over the year with peak flows averaging around 550 million cubic meters (MCM) per month from November to February and averaging around 150 MCM per month from March to October. This therefore is an adequate source. The probable location for the water intake could be at Neelapola on the left bank of the Mahaweli River.

The demand for the water for domestic and commercial of the 1st order service center of Trincomalee is estimated as 38,500 cum per day. The 3rd order urban centers of Kanthlai, Muthur and Kinniya are projected to have populations of 88,000, 100,000 and 93,000 respectively. The corresponding water demand based on the above estimating criteria would be respectively 24,000 cubic meters per day, 27,500 cubic meters per day and 25,500 cubic meters per day. The 4th order center Thambalagamam will need an amount of 24,500 cum per day. The water demand for these urban centers can be met from Kantalai Tank, and the Mahaweli River

14.2.2.2 Fishery and Tourism related development area of Batticaloa

This development area consists of a 2nd order service center of Batticaloa and six 3rd order service centers of Eravur, Vakara, Karadiyanaru, Valaichenai, Kaluwanchchikudy and Kathankuddy. The population in 2030 for this cluster is projected to be around 820,000. The total water demand correspondingly will be around 152,000 cubic meters per day. The possible source would be the Unnichchai Tank to be supplemented by wells located in suitable areas. A detailed investigation would be needed to establish the yield from these sources. (See Map 14-4).

The smaller waterways that drain Batticaloa District are, Verugal Aru, Maduru Oya, Mundeni Aru and Magalavetuvan Aru. These have to be investigated for their potential for supplying this drinking water requirement. In addition investigations of Unnichchai Tank and Vakaneri Tank for their present use, available quantities, quality and cost of supply as drinking water sources have to be done.

14.2.2.3 Agriculture, Industrial and Tourism related development area of Ampara

This area is to be formed by the combination of two 2nd order service centers of Ampara and Kalmunai, and seven 3rd order centers at Sammanthurai, Dehiyathakandiya, Akkaraipattu,

Pothuvil, Damana, Thrukkivil and Uhana. The projected total population in this cluster is estimated to be about 787,000 by the year 2030.

The estimated total water demand based on the above criteria would be in the range of 190,000 cubic meters per day. As the cluster consists of 8 centers that are widely dispersed, the water supply systems have to be planned accordingly. It would be necessary to investigate and develop separate sources of water for each urban center.

The Senanayake Samudraya and Kondawatuwan Tank are two major reservoirs in the district available for the purpose. Mahaweli River flowing along the western boundary and Gal Oya are two rivers that can be tapped for water supply. In addition the Weeragoda Tank, Rottai Tank, Aligalge Tank, Alahena Irrigation Tank, Medagama Irrigation Tank, Lihiniyagama Irrigation Tank, Sandunpura Irrigation Tank, Mahawanawela Irrigation Tank and several other smaller tanks have to be investigated for their present use, available seasonal quantity, quality and cost of supply as drinking water sources (See Map 14-4).

14.2.3 Proposed water supply development strategy

A systematic investigation and assessment of the developments necessary to cater to the needs of the new urban agglomerations proposed under the plan, identification of adequate sources of supply and developing them for use as needed have to be carried out.

Safe drinking water is defined as providing water supplies by the following methods:

Piped water supply systems with adequate treatment;

Deep/shallow wells with hand pumps;

Protected springs;

Protected dug wells;

Protected rain water catchments systems;

Providing physical facilities in water supply, development of water sources, transmission and distribution systems and water storage facilities are designed and developed for long term horizons of about 30 years. The head works for extraction, treatment and pumping systems are developed in stages in line with demand.

The following criteria may be adopted for demand forecasts.

The supply standards have to be determined to suit the local situation. The per capita consumption may be planned to be consistent with national standards. This would be at 145 liters per day (LPD) per capita for house connections in urban piped water supply schemes. In rural schemes the per capita consumption may be computed on 45 LPD for point sources. The quality to be maintained on the NWS&DB standards may be determined from WHO guidelines. Tariff policy initially may include operation and maintenance cost recovery and reduction of non-revenue water at 1% per annum.

Provision of safe drinking water to rural populations has to be addressed in the medium term by implementing community based and owned rural water supply schemes.

14.2.4 Proposals and Action Projects related to water supply

The most urgent activity is an accurate assessment of the condition of the existing water supply systems and potential of the sources identified for supply.

The following actions are needed in the Recovery Phase to ensure maximum safe drinking water supplies for the projected population:

- Catchments protection measures to be commenced immediately

- Measures taken to prevent or minimize pollution of water sources
- Systematic flow measurements of all identified surface water resources
- Preparation of policy guidelines on water sharing procedures with irrigation

Under augmentation and expansion the Government has identified the following water supply schemes for implementation. Ampara, Sammanthurai, Eastern Coastal Integrated, Kalmunai, Dehiattakandiya, Pottuvil, Batticaloa Integrated Scheme, Kathankudi and Valaichchenai. In addition the Government is planning on setting up new piped schemes in Kadirapura, Nawamedagama, Maha Oya, Padiyatalawa, Namal Oya, by the year 2015.

A survey to determine how these projects can be developed to provide for the demand in the new urban agglomerations has to be carried out.

Ground water is the main water resource in the Batticaloa district. Stabilizing the ground water resource requires studies on implementing induced recharge methods and arresting sub surface run off.

Map 14-4 Water Supply Plan - 2030

14.3 Sanitation Sector

14.3.1 Objectives

The declared national objective in the provision of sanitation services to the population of the country include:

Providing access to adequate sanitation to 75% of the population of Sri Lanka by 2010 and to 100% by 2025;

Adequate sanitation standards should require the adoption of the standard septic tank for domestic sewage and the full treatment process for larger institutional, industrial and urban situations.

The prevailing sanitation services in the Eastern Province is so far removed from these targets, that a properly formulated and a realistic plan has to be implemented to reach them.

A realistic plan must have a short term objective, medium term objectives and long term objectives. They should be planned and implemented respectively under the Recovery Phase, Transition Phase and the Stable Development Phase of the proposed Eastern Province Physical Plan.

A short term objective would be to achieve an immediate positive impact on the sanitation situation by: restoring existing services to a usable and maintainable condition immediately; developing the services to meet the backlog of new demand including the demands of the returning populations; ensuring that the services, once restored and developed, are affordable, sustained and maintained.

The planning horizon related to these objectives is based on planning periods of:

- Recovery Phase – 6 years from 2004 to 2009
- Transition Phase – 5 years from 2010 to 2015
- Stable Development Phase - Long Term

The Recovery Phase should also allow for including new and ongoing investment activities according to the Public Investment Program of the Government. The Transition Phase should be aimed at planning and implementing specific projects and the long term period is used for future demand and investment forecasts and implementation of projects.

14.3.2 Projected demand for sanitation requirement in proposed development areas, sub regional centres and 4th order service centres in the Eastern Province

14.3.2.1 Industrial and Port related development area

This consists of the 1st order service center in the Trincomalee Port City with a projected population by 2030 as 141,000, three 3rd order service centers at Kantalai, Muthur and Kinniya having populations respectively of 88,000, 100,000 and 93,000 by 2030 and a 4th order center, Thambalagama with a population of 90,000 by 2030. The development area will have an estimated population of 512,000 by 2030.

The nature of the proposed development requires that the sewerage disposal systems be prepared for each urban center taking into consideration the appropriate method and standards of treatment, cost effectiveness and the environmental demand.

The proposed population density and the industrial effluent discharge needs of the 1st order service center by the year 2030 would require a pipe borne sewerage disposal system with a full scale treatment process. Access to piped water with a potential 24 hour supply catering to the national average consumption of 125 liters per capita per day will generate domestic waste to necessitate such a system. Industrial Institutions will be required to set up their

own pre treatment systems for industrial effluent to conform to the inflow standards required for the piped system.

The other urban centers will have their own methods of satisfactory sewerage disposal systems. Industrial, Commercial & other institutions should have their individual treatment plants to suit their requirements. These medium sized treatment plants are now commercially available and should be used with proper maintenance by the owners of these organizations. The cost of the individual sewage treatment facilities must be borne by the owners of such premises. In less densely populated areas the standard three chamber septic tank is adequate for domestic and smaller commercial institutions.

14.3.2.2 Fishery and Tourism related development area of Batticaloa

This development area consists of a 2nd order service center of Batticaloa and six 3rd order service centers of Eravur, Vakara, Karadiyanaru, Valaichenai, Kaluwanchchikudy and Kathankuddy. The population in 2030 for this cluster is projected to be around 820,000.

The demand for sewerage disposal arises from households, commercial and other institutions, hotels and restaurants and light industries related to the fishery sector. The proposed activities and population densities do not warrant pipe borne sewerage disposal systems in this agglomeration due to their high initial costs and O & M costs. Suitable options suggested in paragraph 10.3.2.1 can be selected for use to suit the particular location or facility.

14.3.2.3 Agriculture, Industrial and Tourism related development area of Ampara

This area is to be formed by the combination of two 2nd order service centers of Ampara and Kalmunai, and seven 3rd order centers at Sammanthurai, Dehiyathakandiya, Akkaraipattu, Pothuvil, Damana, Thrukkovil and Uhana. The projected total population in this cluster is estimated to be about 787,000 by the year 2030.

The options for this agglomeration will also be similar to those at paragraph 14.3.2.1.

14.3.3 Proposed sanitation development strategy

Sanitation needs include the conversion of the present water seal pit toilets to standard 3-chambered septic tanks, provision of safe toilet facilities for those without such facilities at present and the rehabilitation and augmentation of sanitation systems in public institutions such as hospitals, health centers and schools etc.

It is also necessary for the local authorities to equip themselves with gully suckers for emptying toilet pits both in households as well as in institutions such as hospitals, schools etc., and to construct basic oxidation tank type treatment facilities for the septic sludge that will be removed from toilets.

A good reliable and efficient sewage treatment and management systems are essential, not only to ensure the health of residents, but also to preserve the environment in good condition and prevent contamination of waterways. Most local authorities are in need of renewed approaches to management, maintenance and finance. Because of the size and complexity of the problems and institutional indebtedness, the sector is not particularly amenable to private sector involvement at the present time.

Through a community development program the people must be informed about their responsibility in regard to sewage and what they can do to reduce the harmful effects on the environment. All precautions must be taken to keep coastal waters safe and aesthetically acceptable for recreational use.

Regulation and monitoring of individual sewage discharge must be strictly implemented to ensure it meets the standards laid down. The disposal of sewage from shanty dwellings is the most

hazardous threat to the society. In addition the use of open areas such as beaches and marshy land for such purposes has become a significant problem to the environment.

Industrial, Commercial & other institutions should have their individual treatment plants to suit their requirements. Central sewage treatment plants normally provided for larger towns is a longer term need in the Province. The funding for such treatment facilities must be provided by the state or through donor agencies at that time. Treatment and disposal facilities have to meet the demands of the permanent and seasonal population of the region and industry in the short and long term and in an environmentally sound way.

14.3.4 Proposals and Action Projects related to Sanitation sector

A systematic investigation and assessment of the new developments necessary to cater to the needs of the new urban agglomerations proposed under the plan, identification of adequate disposal systems and developing them for use is needed.

Adequate sanitation standards should require the adoption of the standard septic tank for domestic sewage and the full treatment process for larger institutional, industrial and urban situations.

Sanitation needs include the conversion of the present water seal pit toilets to standard 3-chambered septic tanks, provision of safe toilet facilities for those without at present and the rehabilitation and augmentation of sanitation systems in public institutions such as hospitals health centers and schools etc.

It is also necessary for the local authorities to equip themselves with gully suckers for emptying toilet pits both in households as well as in institutions such as hospitals, schools etc., and to construct basic oxidation tank type treatment facilities for the septic sludge that will be removed from toilets.

14.4 Storm Water Drainage

14.4.1 Objective

Storm water drainage is an infrastructure that has to be provided to drain out excess water from rain into the main canals, rivers and ultimately to the sea through surface drains, culverts and streams specifically designed for the purpose.

Considerable damage to life and property is caused by localized and seasonal flooding of populated areas. They also pose serious environmental risks.

The basic objective of the development plan for storm water drainage would be to prepare and implement a cost effective and sustainable system to cater to the above needs.

14.4.2 Proposed storm water development strategy

Infrastructure for storm water drainage is given very little priority resulting in serious problems of flooding and stagnation of water at various places causing considerable inconvenience and damage to the occupants of households and commercial properties of the area with health and environmental consequences.

Before any storm water drainage plans can be drawn up for any area, development proposals for various projects for the area, have to be determined. It will be meaningless developing storm water drainage designs before any such development plans are drawn up.

In areas that are built up checks should be made to find out whether there are water detaining and water retaining media such as marshes, lakes, tanks, paddy fields available in the watershed for temporary retention and gradual discharge of flood water. This water detaining media should be identified and incorporated in the

storm water drainage system and should be maintained properly for use during floods.

Steps should be taken to identify and document all the encumbrances and encroachments into the existing drainage system and document them with all necessary details. Haphazard building construction and dumping of solid waste and poor maintenance of the existing drains result in the contribution to flooding and stagnation. Lack of community awareness and non co-operation to maintain the drains contributes to this situation. Local authority approval of building plans has to include storm water drainage requirements.

14.4.3 Proposals and Action Projects related to storm water drainage sector

The proposed urban agglomerations in Trincomalee , Batticaloa and Ampara will need to be formulated and planned in greater detail for any meaningful action projects for storm water drainage to be proposed.. See Map 14-5 and Map 14-6

However in the recovery phase the following action plan may be implemented

Initially a comprehensive survey and assessment of the condition of the existing systems including the adequacy of the final discharge method has to be conducted to assess the immediate needs of rehabilitation.

In built up areas in the three agglomerations a survey has to be conducted to find out the condition of the existing storm water drainage systems, whether areas are available for temporary retention and gradual discharge of storm water. Steps should be taken to identify and document all the encumbrances and encroachments into the existing drainage system and document them with all necessary details. Thereafter a project formulated to construct adequate storm water drainage systems in the major towns in the areas.

Map 14-5 Storm Water Drainage Plan - 2010

Map 14-6 Storm Water Drainage Plan – 2030

14.5 Power and Energy

14.5.1 General Objective

To provide efficient and reliable power and energy supply in order to support the proposed socio economic development programs in the Eastern Province.

14.5.2 Specific Objectives

- To provide uninterrupted quality electricity supply availability at all times.
- To make available power to meet the demand, created by the envisaged development.
- To make available electricity supply to the rural population.
- To increase the level of electrification from 40% (year 2000) to 80 % of the households by 2010
- To establish power generation plants based on coal and diesel for commercial use by 2010 in Trincomalee District.
- To establish 6 MW of biomass generation plants by 2010.
- To introduce petroleum based energy products within easily accessible points for daily usage.
- To grow fuel wood within the province for consumption within the province and for export to other provinces.
- To establish a 10 MW wind plant within the province by 2010
- To accelerate the implementation of the solar power home lighting project.
- To establish a transmission system to facilitate load growth.

14.5.3 Development Strategies

14.5.3.1 Power

Availability of established institutional arrangement and electrical network is an asset to power sector. Operation, maintenance and minor development works of distribution system is decentralized and is under the control of two Deputy general Managers stationed at Anuradhapura and Trincomalee. The Trincomalee District comes under the purview of the Deputy General Manager at Anuradhapura. The Batticaloa and Ampara Districts are under the purview of Deputy General Manager at Trincomalee. The operation and maintenance of the three districts are manned by four Area Engineers who are assisted by the Electrical Superintendents and their staff. Planning, commercial works and construction works are under Chief Engineers who are assisted by Engineers Electrical Superintendents and their subordinate staff. Generation and Transmission functions are under centralized control. Operation, maintenance, and Development works connected with generation and transmission are handled centrally.

The Eastern Province electrification level stood at 40% in the year 2000 when national average was 56 %. Electrification in Eastern Province is confined mainly to the coastal belt. Electrification of the interior of the province is poor.

There are complaints of low voltage and frequent interruptions in power supply in the province. This cannot be considered peculiar to the province. Attempts are being made to rectify the low voltage problems by system augmentation for which funds are released by the CEB. There are frequent failures mainly due to unduly long medium voltage lines, poorly maintained lines due to disturbances and old lines. These have to be corrected by introducing medium voltage express feeders, reconstructing the lines, adding distribution substations, converting single and two phase lines as three phase lines and maintaining the system. There are some, which cannot be corrected by above means. At the meeting held at

Batticaloa Kachcheri headed by the Government Agent it surfaced that there are voltage problems at Batticaloa and Eravur areas. Ampara grid sub-station is getting overloaded. Demand at Kalmunai is increasing. Also it is having voltage problems. All these need solutions. The best solution would be to introduce 132 kV transmission lines and grid substations.

Load forecast will be based on the estimated population and the proposed development areas in three District within the Eastern Province. The development of load could be viewed under different scenarios. The demand in the Eastern Province in the year 2000 was 73 MW. This amounts to a demand of 50 MW per million of population. During the same period the demand in Colombo City was 126 MW, which amounts to a demand of 200 MW/ million of population.

The GDP share of the Eastern province to total GDP of the country had been 12.2 % in 1980; today it stands at 4.5 %. This is an indication of potential available. The main contribution had been from the agricultural sector. The contribution from industry/commerce is low. Demand from industry/commerce gives a vital contribution to the total electricity demand in the province.

It is expected that real Regional GDP growth rate of between 8-9% during 2005 to 2015, a 7-8% growth rate during 2015 to 2025 and 5-6% growth rate during 2025 –2035. Considering this, we could expect a demand of 382 MW by 2015 and the demand in 2025 could be 990 MW.

14.5.3.2 Energy

The three primary sources of energy are biomass, petroleum and hydro. Their contribution to national power generation in the year 2000 was as follows:

- Biomass 52.9%
- Petroleum 38.8%
- Hydro 8.3%

Of this the local components are biomass and hydro. East has one hydro power station at Inginiyagala it is old and as such requires refurbishment. The capacity of the power station is 11.25 MW. The maximum demand in 2000 was 73MW. There are no commercially grown fuel wood sites in the province. This poses a threat to forestry as forests are being damaged for fuel wood requirement. The land available for fuel wood cultivation is about 100,000 ha. If this land is commercially exploited it could produce around 1.5 million tones of fuel wood which wood have a market value of 2225 million Rupees. This could sustain about 100,000 families. This fuel wood could sustain some Dendro power plants and supply much needed fuel wood to the market.

Petroleum, which is an imported item, is supplied from Colombo. With the liberalization of industry it is freely available. The harbor and oil storage tanks at Trincomalee, strengthens the Province's capacity to supply of fuel. LP Gas is freely available.

The exploitation of solar potential would be dictated by commercial viability. No signs of production of solar power in commercial scale is seen in Sri Lanka so far. However this potential could be utilized in rural areas for individual home lighting and small enterprises, which are far away from the grid supply.

There are prospects for commercial production of wind energy in the Province. The wind map produced by US AID is now available for sale in the CEB. This would facilitate the selection of sites. However, further studies have to be made at site to design the wind plants. Connection to the grid can only be with approval of CEB or the new generation companies to be established.

Wind power has been used for pumping water and it could be used for irrigation purposes.

14.5.4 Future Development of the sector

Power and energy are vital sectors that would play a dominant role in the future development within the province as well as the country. Sri Lanka has almost completely exploited the hydro potential of the country, with the remaining sites having only small potential. The country is more dependent on petroleum for its power production as well as other energy requirements. Dependence on petroleum is very costly. The country should look for cheaper sources of energy.

The probable options are;

- Biomass
- Coal
- LNG
- Nuclear

Production of bio-energy will reduce financial burden to the country and generate employment. Introduction of coal has two advantages.

- Reduces dependence on petroleum
- Cheaper.

According to the study carried out by CEB, the infrastructure cost for transporting, storing and handling LNG is very high. Sri Lanka does not have adequate level of demand to justify LNG as a justifiable fuel option at present.

Nuclear energy is not economical for the present load. There are also technical problems in handling nuclear products.

The proportion of energy supplied by thermal power generation in the country is increasing every year. Since cost of thermal power is high (except coal power generation, which has other disadvantages), it is time to think of new strategies, which will reduce the cost of power generation and distribution. In this context, there are some advantages in decentralizing power generation. These include:

- Regional independence for power
- Reduction in transmission distance and hence reduction in losses.
- Transfer of technology to provinces.
- Local employment generation
- Growth of generation related services in provinces.

Trincomalee has great potential for thermal generation. Already studies have been conducted for a coal power station at Trincomalee. This has been shelved due to environmental and other reasons. It is very necessary to revive this proposal by suggesting mitigation measures to reduce environmental and other hazards of coal power generation.

With the harbor located at Trincomalee, there is a great potential for diesel or any other thermal type power generation in the Eastern Province. Earlier, a 60 MW power generation plant was proposed under the Medium Term Generation Project. As this did not materialize, it may be useful to follow up these proposals for development at the appropriate time.

Electricity is a vital commodity in day-to-day activities. Usage of communication media like TV, radio broadens the knowledge of people. Electricity consumption is increasing due to the expansion of various activities that need power. For example, computer education is being introduced in schools, which are spread all over and need electricity. Electricity is required for preservation of medicine, food items etc. and makes learning convenient. The many advantages of using electric power, such as promotion of industries in villages, reducing migration to cities, keeping the people in villages and promoting agriculture and related sectors, alleviation of poverty by employment generation could change the

living pattern in the villages and cities and bring about growth. Electrification in province should be increased from the present level of 40% to at least 80 % by 2010.

Immediate demand of lighting up homes could be promoted under the RERED project and the project initiated by the Shell Gas Company. This province has an abundance of degraded lands and shrub jungles for growing fuel wood. It is very essential to make use of this potential. Credit facilities are available for the development of renewable energy projects under RERED project. This facility has to be capitalized under RERED project. Dendro power generation is being strongly promoted by Bio Energy Association of Sri Lanka. An extract from their recommendation is given below.

Dendro power entails two main national benefits apart from other environmental benefits due to the avoidance of fossil fuel burning. These benefits are:

Local employment generation and

Relief on the balance of payment deficit due to avoided foreign exchange out flow

These two national benefits need to be recognized by the government by compensating the developers appropriately. This will encourage more investment in the sector resulting in additional benefits to the national economy. For instance a total of just 10 MW of dendro power development avoids foreign exchange out flow of approximately US\$ 5 million per year and generate direct employment to about 5000 rural poor families who may be normally receiving payments from a social subsidy scheme such as "Samurdhi". It is important to emphasize that this compensation should not be looked at as a subsidy but as a reward for avoided burden on the society and the economy.

14.5.5 Targets and development prospects of the sector

The priority target is to ensure that the existing facilities are restored to original condition or an improved condition through rehabilitation or reconstruction. This can be followed up by the development new projects to solve the current problems and remove any prevailing disparities. Meeting the future demand for power should be addressed next.

Previously we analyzed the probable growth patterns for the future. The growth is closely linked to the implementation of development projects and may be dependent somewhat on the political situation as well. Taking a middle path would be a safer approach. Hence a 10 % growth in load has been assumed for planning purposes. Selecting this scenario gives room for changes up or down easily. Based on this, most development proposals are being planned only up to the year 2011. Requirements beyond this period should be planned subsequently. First we shall look into the transmission requirements. There is a need for the introduction of a 132 kV transmission network. A 132 kV link has to be established between Valaichchenai and Ampara. This link will help in the following manner;

- Transmission of added power.
- Construction of new 132/33 kV grid sub-stations.
- Establishing alternate feeding.
- Improving quality of supply.
- Improving reliability.

The Ampara grid substation is presently supplying Ampara, Kalmunai and Batticaloa areas. This sub station is often overloaded and should be augmented to a higher capacity. In order to address the problem of low voltage in Kalmunai, Batticaloa, Kattankudy and Eravur areas, two 132/33 kV grid sub-stations have to be constructed at Pandiruppu and Batticaloa. The upgrading will provide sufficient capacity to meet the growth of load in these areas and reduce the frequency of power outages.

The Valaichchenai grid that was constructed in 1990 is still to be commissioned. The transmission line constructed between Habarana and Valaichchenai is damaged. This needs to be repaired. Once this is repaired, the grid sub-station supply in the Valaichchenai and Batticaloa areas would improve. The increase in capacity will be sufficient to supply the additional demand of the area.

Trincomalee grid substation was augmented recently. However, further augmentation may be needed within the next three or four years, in order to meet the additional demand from expected growth in the Trincomalee grid area. The medium voltage distribution has two voltages. 33 kV and 11 kV. The larger 33kV network distributes power to distant places while the 11 kV network power distribution is limited to town areas.

With the construction of the grid substation, 33 kV express feeders have to be constructed to connect to suitable injecting points. Each grid would require about 20 -30km of 33 kV express lines. These express feeders could inject power at suitable points to improve on load carrying capacity and voltage conditions. Main feeders that are very old have to be replaced with larger sized conductor lines to carry higher loads.

The 11kV system, which is confined to the towns, has to be developed by adding capacity to existing primary substations. Promotion of new primaries should be discouraged other than for special reasons. Existing 11 kV networks should be rehabilitated and strengthened.

Distribution substations have to be augmented and new substations built, as load builds up. Low voltage distribution lines have to be augmented with larger sized conductors while single and two-phase systems have to be converted to three phase systems.

The electrification level in the Eastern Province was about 40 % whereas the average electrification level in the country was 56 % in the year 2000. There are some provinces, which have a level of electrification of 80% or more. If the Divisional Secretary level electrification is analyzed the disparity within the province itself is very large. The electrification in Divisional Secretary Divisions ranges from as low as 0.02 % to as high as 90 %.

The present policy of the Government is to reach 80 % electrification level by the year 2005. This is to be achieved by extending the electricity grid lines and by developing renewable energy sources. Renewable energy proposed from solar cells could only meet the basic demands. It is still not viable for commercial demands. Power from grid electricity network is the cheapest source for all commercial needs. Considering the present situation it may not be possible for the Eastern Province reach the target by 2005. However, it may be possible to reach this target by about 2010. Financial requirements for electrifying the Eastern Province up to 80 % level by 2010 is given below on the assumption that Rs. 40,000/= is required for supplying power to one new consumer.

The Province is dependent on power from main grid, which is supplied through a circuitous route. With growth of the load within the province more power has to be injected into the province by upgraded transmission lines. The future growth would have to be based on thermal power generation. Hence it would be cheaper to generate electricity closer to load centers. There is potential for generation of thermal power within the province. The potential is for coal and diesel generation at Trincomalee and bio generation in several sites within the province. Studies have already been carried out for 3x300 MVA power station at Trincomalee. This has been abandoned due to environmental and other reasons. The establishment of a 300 MW generation plant in Trincomalee would be a viable option, as demand in the Eastern Province and surrounding areas would increase to about 300 MW by 2010. This could be upgraded to 3x300 MW plants subsequently with further increase in demand.

Generation of diesel power is facilitated due to the presence of the Trincomalee harbor. Development of both diesel and coal generation plants gives flexibility in the choice of fuel for

generation thus giving the option to produce at the lowest cost depending on the price of the fuel used. Dependence only on one fuel source for power generation would be risky. Thus both types of generating plants are recommended for the Eastern Province.

Power generation from biomass is another option for the Province. Studies carried out by the Bio Energy Association of Sri Lanka shows that generation using sustainably grown fuel wood is carbon neutral and environmentally friendly. One MW of generation requires 400 hectares of land. Each MW of generation could provide employment for 300 workers for 150 days and generate an annual income of Rs. 30,000 per year per head. Income of households employed in fuel wood cultivation for power generation could be doubled. By limiting the generation capacity to one or two MW the plants could be located close to degraded/ shrub jungle sites. Citing them away from grid substations gives the advantage of stabilizing voltage and improving the supply conditions. Further one or two MW plants are easily manageable. Credit facilities are available at concessionary interest rates under RERED project to private sector organizations for establishment of generation plants using fuel wood.

Solar power generation is still not viable on a commercial basis. However lighting needs of homes far away from the grid lines could be met. An average sized solar panel for home lighting would cost Rs. 60,000. Under the RERED project a subsidy up to Rs. 10,000 is available. These panels are adequate for a operating a black and white TV and two to three Compact Fluorescent Lamps (CFL). Even schools, dispensaries and stand-alone telephone booths could be served by solar cells. Credit and subsidy facilities are available for the installation of solar panels in 100,000 homes and 1000 enterprises in the North East, Sabragamuwa, and Uva Provinces up to year 2007.

Perennial availability of wind above 10 km/h is required for establishment of commercial wind power generation plants. The wind map prepared by US AID and presently available for sale with CEB, identifies wind condition at different sites. Using this data, one could identify possible sites, which could be considered for wind generation. Entrepreneurs willing to establish wind plants on a commercial scale should carry out site-specific studies and obtain clearance from the CEB and enter into Power Purchase Agreement (PPA) before commencing any activities. Viability of wind generation improves with the escalation of fossil fuel prices, with the added bonus of environmental benefits.

Irrigation sites far away from grid lines could make use of windmills for pumping water if wind potential is available. The wind speed required for this is lower than that required for a large sized wind power plant.

14.5.6 Spatial distribution of the current status and recommended actions.

The future projects up to year 2011 are marked in the maps (See Map 14-7). Environmental clearance is required for power plants and extra high voltage transmission lines. Design and construction should have minimal impact on the environment to obtain clearance. 132 kV Transmission lines require 120 feet width right of way. The impact of this could be reduced by routing lines through paddy lands and degraded lands as far as possible. Wherever the routing of the line is through built up areas due consideration should be given for future building requirements. In order to use the lands in the transmission line routes beneficially short aged crops should be encouraged.

14.5.6.1 Works proposed under ADB Needs Assessment Study

Distribution - Trincomalee District

Rehabilitation / Reconstruction work

- 33 kV line from 6th mile post to Gomarankadawela
- 33 kV line from Kivulakada to Pulmoddai
- 33 kV line from Palampaddaru to Kithuluthuwa
- 33 kV line from Grid Substation to 6th mile post
- Upparu/ Gangai crossing
- 33 kV line from 4th mile post to Kinniya ferry
- 33 kV line from Upparu to Muthur
- 33 kV line from Thambalagamam Koviladdy to Kachchakudithivu
- 33 kV line from Anuradhapura junction to Kinniya
- 33 kV line from Thoppur to Seruvila Pansala
- 33 kV underground cable at Chinabay

New work

- 1) 2*2 MVA Primary Substation at Seaview Road, Trincomalee
- 2) 33 kV Lynx line from Trinco Grid to Thambalagamam
- 3) 33 kV Gantry at 6th mile post Nilavelli
- 4) 33 kV line from Trinco Grid to Sea view Road

ii) Batticaloa District

Rehabilitation / Reconstruction Work

- 1) 33 kV line from Kalkudah to Passikudah
- 2) 33 kV line from Pillyaraddy to Valaichchenai
- 3) 33 kV line from Muhaththuwarem to Kallady
- 4) 11 kV line from Passikudah Primary.

New work

- 1) Augmentation of Eravur Primary from 1x2 MVA to 2x2 MVA
- 2) Construction of 2x1 MVA Primary Substation at Kodkaikallar
- 3) Construction of Lynx line from Valaichchenai Grid Sub. to Batticaloa

iii) Ampara District

Rehabilitation / Reconstruction work

- 1) 33 kV line from Ampara to Periyapullumalai
- 2) 33 kV line from Bakkiyalla to Batticaloa
- 3) 33 kV line from Lahugala to Pottuvil
- 4) 33kV line from Akkaraipattu to Thirukkivil
- 5) 11 kV line from Kiddangi to Chavalakadai
- 6) 11 kV line from Sorikalmunai to Weeramunai
- 7) 11kV line from Pandiruppu to Florry Road

New Work

- 1) Conversion of 7/.102 conductor to 7/.161 Oluvil/Addalachchenai 11 kV
- 2) Conversion of Kalmunai/Periyaneelavanai line to 33 kV
- 3) 11 kV line from Primary to Kalmunai mosque
- 4) Additional 11 kV feeder from Karaitivu Primary to Mallikaikadu
- 5) 11 kV link line from Kaddakarai to Mahavidyalaya Road
- 6) Reconductoring 11 kV Kovil Road /Premahal Junction
- 7) Reconductoring Ampara / Akkraipattu 33 kV line

iv) Distribution substations and low voltage lines

The damage to 56 distribution substations and connected low voltage lines have to be repaired /rehabilitated. The cost of rehabilitation/ reconstruction and development work, primary substations, medium voltage lines, distribution substations and low voltage lines amounts to US \$ 10.3 Million

Transmission Lines and Grid Sub-stations:

New 132 kV Transmission line from Ampara to Valaichchenai.

Augmentation of Valaichchenai 132 / 33 kV Grid Substation

Augmentation of Ampara 132 / 33 kV Grid Substation.

New 132 / 33 kV Grid substation at Pandiruppu

A total of US \$ 25 Million would be required to undertake the above works according to a Needs Assessment Study undertaken to assess the cost.

Transmission

An assessment of the requirements for transmission lines and grid substations beyond year 2011, requires systematic study. This would be done by the CEB or its restructured organization from time to time. Representations were made at the meeting held at the Kachcheri, Batticaloa that the voltage in the Batticaloa Municipal area was very low. This problem could be improved with the repair of the Valaichchenai Grid Substation and its connection to Batticaloa by a 33 kV Lynx line. It is expected that the substation will be repaired during the course of this year. With the construction of Pandiruppu Grid Substation the situation would improve further. However, the above solutions are temporary, and a permanent solution would require the construction of a Grid Substation near Batticaloa. This would improve the low voltage situation prevailing in Batticaloa and Eravur areas, as well as meet the future demand of the western part of Batticaloa. The grid substation would cost around US\$ 4 Million and can be constructed only after the completion of the Ampara / Valaichchenai 132 kV line (See Map 14-7 and Map 14-8).

Construction of a grid substation and associated 132 kV transmission line between Batticaloa and Eravur town in the western part of Batticaloa –US \$ 4 M

Augmentation of Trincomalee grid substation—US \$ 2 M. Requirement under this amounts to US \$ 6 M. The funding has to be met by CEB

14.5.6.2 Rural Electrification

The most important activity proposed under this is the construction of new rural electrification schemes. An allocation of US\$ 16.6 million has been proposed for this activity according to the needs assessment study. In order to increase the electrification level to 80 % the total cost increases to US \$ 55.9 million, the balance sum required is US \$ 39.3 million.

As indicated earlier, the electrification level ranges from 0.02 % to 90 % within the province. Hence, electrification of the villages must be undertaken according to the policy, so as to remove the disparity systematically. The average electrification level in the country is 56 %. Hence it would be advisable to take up all Divisional Secretary Divisions having electrification level below 56 % and bring them up to 56 % initially. Within this group, DS division areas with very low electrification should be given very high priority in the selection process. Development beyond 56 % should be agreed upon at the political level. Funding for this has to be arranged by the Ministry of Power and Energy.

Map 14-7 Electricity Plan - 2010

14.5.6.3 Medium voltage lines and substations

Existing medium voltage lines and substations need augmentation in order to improve voltage, reliability and meet future demand. The improvements proposed are, conductor improvements to lines, introducing new lines and substations, conversion of single phase and two-phase low voltage lines as three phase lines. The jobs to be undertaken are.

Trincomalee

- 25 km 33kV line between Jayanthipura and Somapura—Rs.20 M
- 2 Km 11 kV line in Trincomalee town area—Rs. 2 M
- New, 76 km 33kV lines – Rs.67 M
- New, 100 Nos.33 kV / LT 160 kVA substations—Rs 105 M
- 389 km single phase to three phase conversions –Rs.67 M
- 35 km two phase to three phase conversion –Rs. 33 M

Ampara District--Ampara Area

- Ampara /Weeragoda D/C Lynx line—Rs.20 M
- Reconductoring 11kV Cu. Line –Rs-18 km-Rs.18 M
- 35 km 33 kV re-conductoring – Dehiattakandiya/Mahiyangana boundary to Phitiwewa on Mahiyangana feeder-Rs35 M
- New, 295 km 33 kV line -- Rs.301 M
- New, 390 Nos. 33kV/LT 160 kVA substations ---Rs.388 M
- 825 km single phase to three phase conversion –Rs.143 M
- 80 km two phase to three phase conversions –Rs 8 M

Ampara District—Kalmunai Area

- New 76 km 33kV line –Rs 81
- New 100 Nos. 33kV /LT substation—Rs.104 M
- 180 km single phase to three phase conversion—Rs.31 M

Batticaloa District

- 12 km 33kV D/C Lynx line from Pandiruppu grid to Baticaloa.- Rs.33 M
- 70 km 33kv D/C Lynx line from Valaichchenai to Polonnaruwa.-Rs 191M
- 40 km D/C Lynx lines from Batticaloa grid—Rs 109 M
- 120 km ,New 33kV lines –Rs 126 M
- New 158 Nos ,33kV/LT substations—Rs.162 M
- 427 km single phase to three phase conversions –Rs. 74 M
- 20 km two phase to three conversion—Rs. 1.9 M

The financial requirement under these amounts to US \$ 22 M. funding has to be met by CEB

14.5.6.4 Generation

To supplement the load requirement and also to establish an independent generation facility, the shelved Trincomalee coal plant needs to be revived. Some changes in design and layout may be necessary to overcome the objections, which resulted in the shelving of the project. Initially a 300 MW plant may be established. According to the present policy on thermal generation this power station has to be built on BOO basis. At present, the value of the investment will be approximately US \$ 420 million. Commissioning this power station before 2010 would be ideal. Employment generation as result of this project will be considerable during construction stage, which would last about three years. This will also promote growth of several industries around project area. Employment even after the completion of the project would be considerable (See Map 14-7 and Map 14-8).

It is recommended that the following plants be onstructed, 2 MW dendro power plants each at Thiriyai/Madawachchi area in Trincomalee District: Karadiyanaru / Rukamputur in Batticaloa District and Komari/ Lahugala area in Ampara District. The cost of

these 6 MW plants would be US \$ 6 M. This work, which should be undertaken by the private sector, could generate additional income for about 2000 families.

Detailed studies on the wind patterns should be carried out and 10 MW wind plants established at least by 2010. Cost of these plants would be around US \$10 M. and may be handed over to the private sector for implementation.

Map 14-8 Electricity plan – 2030

14.6 Telecommunication

14.6.1 General Objective

To provide of an efficient and reliable information and communication system in order to support the proposed socio economic development in the Eastern Province.

14.6.2 Specific Objectives

- To provide telecommunication facilities for rural areas of the region.
- To provide telephone connections to a level equivalent to 100 connections per 1000 of population by the year 2010.
- To provide high quality telecommunication facilities according to the quality standards set by the Telecommunication Regulatory Commission.
- To reduce the number of people in the waiting list for telephones to zero in 2020
- To reduce connection charges and tariffs to regional parity level.

14.6.3 Future development anticipated in the telecom sector

Telecommunication is a sector that is advancing rapidly all over the world. Sri Lanka should also aim at achieving rapid growth, if we are to face the challenges of globalization. The Government has taken a policy decision to introduce e-governance and to promote Information and Computer Technology (ICT). Computer Education is being given a high priority and computer labs are being opened in schools. Computer education cannot be considered to be complete without Internet facility, for which telephone connections are needed. As a result there is a high demand for telephone and internet connectivity in this area.

E-governance, which is being introduced in all Government Departments, would promote networking. This is another area of high demand. Most banks, corporations and commercial institutions have been computerized and in order to link with their branches in the districts they need networking.

Considering the resources and past development it can be observed that agriculture and fishing are the base for the GDP growth in the Eastern province, with tourism providing a substantial contribution. Growth of these sectors along with their value added services would create a demand for telecommunication and its value added services.

Universities, Affiliated and Technical Colleges, Vocational Training Centers and other learning institutions of excellence will connect to and extend the LEARN networks. Wide Area Networks (WAN) and Local Area Networks (LAN) would be added features.

The geographical area to be covered by telecommunication is very wide. Therefore operators should address ways of reaching consumers, who have no connectivity at all, when they expand their networks to other areas. Government has already introduced the Viswa Grama fund to extend telecommunication to villages. Dialog GSM has entered into an agreement with the World Bank to promote telecommunication to rural sectors. These are a very healthy signs. Other lending organizations should follow this example and promote development of rural sector by giving soft loans. Mobitel is operating in a limited area around Trincomalee town. It has plans to extend its coverage by constructing three more towers around the periphery of Trincomalee town during the course of this year.

The above factors show that telecommunication has a tremendous potential for development, and can be accelerated if there is peace in the region. With advancing technology, the prices of equipment and services are declining. Communication is a vital need for living and an asset for businesses. Telecommunication facilities reduce costs and increases efficiency and effectiveness. Introducing telecommunication facilities to the villages, will help to increase

productivity and income of farmers and fishermen and reduce exploitation by middlemen. The present investment climate is ideal for the expansion of telecommunication. With the proposed developments, there is a great possibility that the Eastern Province could reach the 10 % (10 phones for 100 people) by 2010, from the current level of 3% (3 phones per 100 people).

14.6.4 Proposals for telecom Sector in the Eastern Province

The estimated population for the three districts in the Eastern Province is as follows:

District	2010	2020	2030
Batticaloa	674,000	852, 000	1,130, 000
Ampara	711, 000	940, 000	1,099, 000
Trincomalee	446, 000	599, 000	700, 000
Total	1,831, 000	2,402, 000	2,930, 000

The growth rate of telecommunication in Sri Lanka from 1996 is as follows:

➤ 1996	40.4 %
➤ 1997	58.7 %
➤ 1998	26.3 %
➤ 1999	21.3 %
➤ 2000	22 %
➤ 2001	18 %

From the above, it can be observed that the growth rate has been varying from 18. % to 58.7 %. Growth had been 58 % when there was a vacuum in the industry. It has dropped to 18 % in 2001. Changes in policies too affect the growth pattern.

The future scenario of this sector in the Eastern Province, has been estimated for three different growth rates and is presented below. Table 14-2 shows telephone connections at a growth rate of 12 %.

Table 14-2 Telephone connections at 12 % growth rate

District	2003	2010	2015	2025
Trincomalee	12,847	28,400	50,156	155,453
Batticaloa	14,366	31,758	55,970	173,833
Klamunai Area Ampara area	15,241 8,400	33,693 18,570	59,379 32,726	184,421 101,642
Total	50,854	112,421	198,231	615,349

This amounts to 26.7% teledensity by 2025

Table 14-3 shows telephone connection at a growth rate of 10 %.

Table 14-3 Telephone connections at 10 % growth rate

District	2003	2010	2015	2025
Trincomalee	12,847	25,035	40,319	104,578
Batticaloa	14,366	27,995	45,086	116,943
Klamunai Area Ampara area	15,241 8,400	29,700 16,370	47,832 26,362	124,066 68,378
Total	50,854	99,100	159,599	413,965

This amounts to 18. % teledensity by 2025

Table 14-4 shows telephone connection at a growth rate of 8 %.

Table 14-4 Telephone connections at 8% growth rate

District	2003	2010	2015	2025
Trincomalee	12847	22017	32350	69843
Batticaloa	14366	24620	36176	78101
Klamunai Area Ampara area	15241 8400	26120 14396	38379 21153	82858 45667
Total	50854	87153	128058	276469

This amounts to 12% teledensity by 2025

Based on the above forecast the telephone density in the province in the years 2010,2015 and 2025 would be as follows.

Table 14-5 Teledensity at 12% growth rate

Year	Population	Expected connections	Telephones for 1000 persons
2010	1736798	112421	64
2015	1908106	198231	104
2025	2304221	615349	26.7

Table 14-6 Teledensity at 10% growth rate

Year	Population	Expected connections	Telephones for 1000 persons
2010	1736798	99100	57
2015	1908106	159598	84
2025	2304221	413965	180

Table 14-7 Teledensity at 8% growth rate

Year	Population	Expected connections	Telephones for 1000 persons
2010	1736798	87153	50
2015	1908106	128058	67
2025	2304221	276469	120

Computer literacy would play a strong role in the development of telecommunication sector, as they are closely interlinked. Even though computer education is being introduced in schools, it would take several years before we can see the full results. In the mean time there are several advanced level qualified unemployed/underemployed students who should be trained in the computing field. A good computing education needs a good English knowledge. As such special attention should be paid for imparting English knowledge.

This would make it easier for the commercial sectors to meet their human resource demands locally. Thus the computerization and the networking would grow. This would apply to government and semi-government sectors also. Computer education has to be introduced to those who are in service already. Availability of human resource would play a leading role in the growth of telecommunication sector.

Several proposals are given under regaining Sri Lanka for the growth of telecommunication and IT sectors. Some recommendations are quoted below.

Area	Objectives / Strategy	Priority actions
Bridging the Digital Divide	Stimulate ICT enabled social development	Establish a national fund to support innovative applications of ICT for social and rural development. NGOs and private sector would submit proposal through a competitive process
	Increase connectivity in rural areas	Establish universal access policy obligations for licensed operators to contribute to UA ,creation of telecommunication fund, Encourage the construction of multipurpose community centers, first through pilot program
	Support the development of film and content industry.	Abolish the State owned National Film Corporation and replace it with a Film Industry development Board Digitise educational video material into digital format for interactive training and infotainment
	Establish community radio and TV networks to act as gateways to internet.	Open up the community radio and TV sectors : integrate ICT structure to bring wealth of Internet to villages: provide frequencies to community radio and TV stations
	Enhance TV/ radio staff's competence in the use of multimedia applications	Design curriculum in multimedia training of the TV, radio staff in co-operation with private sector and NGOs
	a) Making telecommunication accessible to the poor	Regulations will be passed to enable e-commerce Developments of IT techno parks Liberalize voice telephony and fixed wire line services Upgrading IT programs in secondary schools and Universities to boost the number of IT literate persons
	b)Open up international services after August 2002 . A phased approach	Ensure greater independence and authority to the TRC to regulate all the ICT sectors. Structure the organization , appoint qualified and credible chair and full time commission members , train the TRC staff , and ensure transparent regulatory proceedings. Strengthen the Commissions spectrum management functions and capabilities.
	c)Increase the competition and complete the liberalization of the sector	<ul style="list-style-type: none"> ▪ A class license scheme for International gateways for international communications will be established ▪ Mobile phone licensing will be gradually relaxed once spectrum management is brought up to reasonable levels. Pricing arrangements in which mobile calls are charged to the receiving party will be replaced by a calling party pays scheme. ▪ A telecommunication development fund will be established to finance the rollout of domestic connections , including broadband services.
d)Transforming the postal system into an information and finance portal	<ul style="list-style-type: none"> ▪ Postal rates increased in 2002 to reduce losses. ▪ Where viable telephone and Internet facilities will be introduced in sub-post offices. ▪ Postal services will be restructured and commercialized. ▪ Private sector will be allowed to compete in postal services. ▪ Postal services will be integrated with a major bank to provide selected financial services. 	
Bringing internet into the countryside	<ul style="list-style-type: none"> ▪ Improve computer facilities in rural secondary schools ▪ Public support will be provided for post secondary computer training centers ▪ Community radio stations will be developed with digital radio cum-internet facilities. ▪ Internet connections provided to SME promotion agencies in small towns and rural areas through the gradual roll-out of broad band network ▪ Expand the incubator concept established for the IT companies provide seed capital for entrepreneurial ventures. ▪ Pilot program to train non- ICT professionals in effective use of ICT tools in priority disciplines (such as science ,engineering ,medicine,management0 in tertiary education. ▪ Pilot programming for e-learning in these areas of tertiary education ▪ Pilot program in computer literacy and in the use of ICT to enhance quality and reach of primary and secondary education. Pilot e-learning programs for teacher training 	

14.7 Port Development Plan

14.7.1 General Objective

To develop Trincomalee port as the motivating force for the development of the Eastern region in achieving an open and competitive economy while strengthening economic ties with the Colombo area.

14.7.2 Specific Objectives

To narrow the disparity that exists in terms of port development, between the Trincomalee Port in the Eastern region and the hub Port of Colombo in the Western regions.

To develop the hinterland to its full potential with support of the Port of Trincomalee

To enhance the role of the Port of Trincomalee as a Multipurpose International Terminal, Energy Supply Base, Passenger Marine Terminal, Production Base, Industrial Base, Entrepot Trade Base, Petroleum Refining and Bunkering Base and Tourism Base.

14.7.3 Development plan for Trincomalee Port under Recovery Phase

Major industries of the Eastern region are cement manufacture, flour milling and associated industries such as production of bran. Presently both these are overseas trade oriented industries and have their own private facilities. Petroleum fuel required for the region and bunkers are discharged at the privately operated oil terminal.

Almost all the perishable items such as fruits, onions, potatoes, sugar which are imported to Sri Lanka from the neighboring countries are brought to the region overland from Colombo. Fertilizer requirement of the region, which is 35% of the national figure, is unloaded in Colombo mixed in plants located near Colombo and transported overland to the region. Other commodities required for the building industry such as iron, steel and timber are discharged in Colombo and hauled overland to the region.

Although Trincomalee is famed as the best natural harbour in the world, with sufficient water area and depths to moor and manoeuvre super tankers, almost all the cargo are being handled at privately owned or privately operated terminals. However in 2002 with the commissioning of the Ashraff Jetty, the only public deep berth that could accommodate cargo vessels up to 40,000 DWT, the cargo-handling situation has had a complete transformation.

For the first time some 96,000 Tons of coal were unloaded during a period of 8 months and transported overland to the cement works in Puttalam. This shows that it may be cheaper to unload cargo in Trincomalee Port from large bulk carriers and transport it overland to point of use than to unload it in the Colombo Port and transport overland. It is anticipated that the demand for coal would increase by 60% with the commissioning of a coal powered power plant in the near future at the cement factory at Puttalam. If the coal powered plant is established in Trincomalee, then Trincomalee port would be the obvious choice for unloading coal.

Sugar too had been discharged after a lapse of time in Trincomalee. That too at the Ashraff Jetty, thereby, signaling the fact that food in bulk would be imported to the region through Trincomalee Port.

With the peace initiative coming to fruition, the acreage under agriculture is bound to increase and in turn increase the demand for fertilizer. In the near future fertilizer required for the region could be imported in bulk to Trincomalee, mixed in plants located near the port of Trincomalee, for distribution throughout the region.

Establishment peace in the region will give an impetus to the construction industry, which will result in more cement, timber,

iron and steel being used in the region. A cement company has shown interest in establishing a cement bagging or a grinding plant in close proximity to the Ashraff Jetty.

At present the Ashraff Jetty with a quay length of 256m and alongside water depths of 13 m is estimated to handle 300,000 Tons of break bulk and dry bulk cargo. Since the estimated cargo to be handled may exceed a million tons by 2012, it will be prudent to extend the existing jetty in a North Easterly direction toward Cod Bay by 100m and in a South Easterly direction by 364m towards the Ceylon Jetty to form two extra berths. The construction of the second berth by extending 100m towards the Cod Bay and 124m towards the Ceylon Jetty is required to be undertaken on an urgent basis. The water area behind the berths is to be reclaimed for transit sheds and yard area. The construction of the third berth is to be undertaken when Dry Bulk Shipping activity commences and when Trincomalee becomes a Cruise vessel Destination. The Cost of the extension of the Ashraff Jetty by one more berth is estimated at Rs. 4,500 Million.

14.7.4 Development plan for Trincomalee Port under Transition Phases and Steady Development Phase

When considering the long-term plan for the Trincomalee Port, the aforementioned role of the Port must be assessed, particularly with respect to how the following four aspects will have a bearing on the future role of the port.

(1) The draft revision of the National Ports and Shipping Policy of Sri Lanka mentions that the Trincomalee Port will be developed within a National Master Plan as a multipurpose port with industrial services as well as shipping related activities.

Following activities are to be developed in the Trincomalee port: -

- Break bulk and bulk handling
 - Ship repair, boat and shipbuilding, bunkering salvage and towage (Trincomalee has ample opportunities to attract vessels on international sea routes.)
 - Tourism related marine activities such as marinas, pleasure crafts and a cruise vessel destination.
 - Development of facilities for entrepot trade and multi-country consolidation.
 - Salvage and towage.
- (2) The ministry of Policy Development and Implementation in their Infrastructure Development Plan for Sri Lanka proposes the following projects which will have an impact on the development of the Eastern Province as a whole and the development of Trincomalee Port in particular.
- Land Bridge to India
 - Mannar - Trincomalee Road.
 - Colombo, Krunegala-Trincomalee Expressway which connects Trincomalee to the Katunayaka International air port through the proposed Outer Circular Highway and to Kandy through the Kandy-Matale-Dambulla expressway.
 - Trincomalee Industrial Zone
 - Trincomalee-Foul Point highway.
 - Foul Point Harbour
 - Trincomalee Coal Power Plant
 - Eastern tourism development
 - Ampara-Batticaloa Highway

(3) Impact that the ports of the neighbouring countries such as India, Pakistan, Bangladesh, Thailand and Malaysia would have on the development of the Trincomalee Port

(4) Impact of the Sethusamudram Canal Project on the Trincomalee Port development.

When studying the long-term development of the Trincomalee Port, the hinterland that the port is designed to serve has to be taken into consideration. A review of the distances of the center of administration of the districts from the port, indicates that the

hinterland of the Trincomalee port is most likely to be composed of the following districts.

- Vavunia
- Batticaloa
- Ampara
- Trincomalee
- Anuradhapura
- Polonnaruwa

With the varying biodiversity of the hinterland and the availability of natural and ecological and archaeological resources it will be useful important to determine how the port could be used optimally.

Trincomalee port comprises an Inner Harbour and the Koddigar Bay, which have the Outer Harbour and its approaches. High cliffs, which flank the Inner Harbour on the seaside protect it from the monsoon winds, and provide sheltered waters. Though the Inner Harbour is reputed to be the best natural harbor in the world, having water depths that are suitable for the movement and berthing of small, medium sized and large deep drafted cargo ships, oil tankers and even super tankers, the flat area for development work is limited. A considerable portion of the available flat terrain is either urbanized or restricted for use presently for security reasons.

As the bulk of the restricted areas will remain under the control of the security forces even after normalcy returns to the region it will be the responsibility of SLPA under whom a major portion of the land is vested and the regional authorities to make the most of its value by instituting a land use master plan.

The land use master plan should incorporate other land use plans such as plans to preserve the environment, urban development and economic development plans and should be in conformity with them. Notably it should be in conformity to the policies relating to the Trincomalee Port as spelt out in the National Ports and Shipping Policy of Sri Lanka. Most importantly a proper land use master plan for the water front area will prevent the spread of port facilities in to the susceptible urban water front area thereby augmenting the benefits to the urban population of Trincomalee.

The waterfront area and the water area in China Bay and Cod Bay where the Cement Plant, the Oil Jetty, Ashraff Jetty and Oil Tank Farm are located could be exclusively set aside for cargo handling operations and for the fisheries industry.

The proposed extension of the Ashraff Jetty to have either a total of two or three jetties, the associated reclamation of the water area behind the jetties, the warehouse and the state of the art cargo handling facilities that would be set up on the jetty and the reclaimed land will satisfy the role of Trincomalee Port having a Multipurpose International Terminal for bulk and Break Bulk operations which also could be used as Passenger Marine Terminal for cruise vessels.

To establish an industrial base, flat waterfront land is required. As most of the waterfronts are in hilly, restricted or urbanized areas, the option available is to locate an area, which could be reclaimed for such use. The Yard Cove area with the availability of shallow depths for easy reclamation will be suitable to establish export oriented dry industries, multi-country consolidation and entrepot trade.

The waterfront area in Powder Bay and Town Bay known as Inner Harbour should be set aside for the development of an urban waterfront and should be used for promenades, marinas and pleasure boat operation for the benefit of the urban population and tourism.

The Oil Jetty situated in the waterfront of China Bay could be utilized as the Bunkering Base and the Tank Farm area behind the China Bay railway station could be gainfully converted in to a refinery base.

The three white beached coves of Marble Bay, Sweat Bay and Dead Man's Cove with the hilly land mass behind them, Clappenburg Island and Bay which are environmentally sensitive should be set aside for tourism.

The area of the harbour to the South of the Clappenburg ridge and the land area presently restricted for use due to security reasons, which has a large flat terrain, have been earmarked for dry bulk handling. Since this is a very lucrative industry an overflow of the activity may occur due to the scarcity of land. Such overflows could be accommodated in the Foul Point Port, which is to be designated as the port for heavy industries.

Koddigar Bay, which includes the Outer Harbour, should also be considered for the setting up of port related activities. The Foul Point Harbour proposed in the Koddigar Bay under the Infrastructure Development Project for Sri Lanka should be solely set-aside for Mega Power Generation Base, which will supply power to implement the development activities, including heavy industries such as dry docking facilities for ship building, major ship repair and petroleum refining. (See Map 14-9)

14.7.5 Impact of ports in the India, Pakistan, Bangladesh, Myanmar, Thailand and Malaysia

It was in 1998 that Sri Lanka and India signed the Indo-Sri Lanka Free trade Agreement. (ISFTA). Although the ISFTA should have come into effect on 1st March 1999, it really came to operation on 1st March 2000. Since then bilateral trade between the two countries had steadily increased. Sri Lankan exports to India increased from US\$ 69.4 million in 2001 to US\$ 167.7 million in 2002 T. Bilateral trade between the two countries reached the US\$ 1 billion mark in 2002 with Indian exports amounting US\$ 831. In 2003 bilateral trade had increased to US\$ 1.36 billion.

Considering its strategic location at the crossroads of East-West maritime route and its proximity to the Indian ports, particularly of the East coast and the potential of the port and the availability of land for development, the government together with its trade promotion bodies such as the Board of Investment, Customs Department and the National Chamber of Commerce should use the opportunity rendered by the ISFTA to woo foreign businessmen, who are looking at the Indian Market, to invest in Trincomalee.

Creation of another free trade zone aimed at encompassing nearly two billion people and involving five nations – Bangladesh, India, Myanmar, Sri Lanka and Thailand – was signed in 2003. The FTZ will come in to force by 2017. However in the mean time as a precursor to it the five countries will start cutting import taxes on trade items in mid 2006. This would strengthen Trincomalee port as the stepping-stone for foreign investors to access the markets of Bangladesh, Myanmar and Thailand.

Although Sri Lanka has a well established export oriented manufacturing industry, a market and investor friendly policies and duty free imports of raw materials and machinery for qualifying industries, the infrastructure of Trincomalee is not in a favourable condition to attract both local and foreign investments. In order to achieve the objectives spelt out in the National Ports and Shipping Policy for the Trincomalee port, basic infrastructure such as abundant supply of pure water, reliable power supply, living accommodation or housing up to a reasonable level of sophistication and above all a fast highway connecting the commercial and the administrative capital Colombo are essential.

Statistics shows that during the ten-month period from Jan. 2002 to October 2002, the Colombo Port handled 13,047 containers of domestic cargo imports and 18,126 containers of domestic cargo exports to the ports in the east coast of India and Bangladesh. Trincomalee is the closest major Sri Lankan port to any port in the East coast of India and Bangladesh. Shippers stand to gain from savings in fuel and the sailing time, by handling these domestic containers in Trincomalee rather than in Colombo. The Government of Sri Lanka should consider giving this service to

Trincomalee port by constructing an additional berth as an extension to the Ashraff Jetty. This will not only lead to the development of the port but also pave the way for the industrialist to make use of the full potential of the port, with excellent infrastructure facilities and an abundance of the cheap land to establish their industries.

14.7.6 Implication of Sethusamudram Canal Project

The Sethusamudram Canal Project involves the dredging of a canal near Rameshwaran a township in the Pambam Island in the South Eastern tip of India connecting the Gulf of Mannar and the Palk Bay. The canal would originate from Tuticorin Port extend in a North-North East direction in the Gulf of Manner up to Rameshwaran Area and then proceed towards the Palk bay, parallel to the Indo-Sri Lankan Boundary and join the Bay of Bengal opposite Point Calimere. The canal will connect East and the West coasts of India. The canal initially dredged to 9.15m will provide access to ships from the East Cost and West Coast of India.

Once the project is completed Tuticorin and Chennai will become nodal ports. The distance from Cape Comorin to Chennai will be reduced from 775 to 402 nautical miles, and Cape Comorin to Visakapatnam from 1014 nautical miles to 719 nautical miles. The distance from Tuticorin to Calcutta will be reduced from 1371 nautical miles to 1031 nautical miles. It is estimated that the dredging of the canal initially up to 9.15m would enable 1792 ships to navigate the channel annually.

At present ships plying between the West and East coast ports of India have to sail round Sri Lanka. By using the proposed sea route through the Sethusamudram channel, the cost savings in fuel and sail time would be appreciable.

Although the project will bring substantial benefits to Indian shipping industry it spells doom to the port of Trincomalee and more importantly to the environment. It is said that dredging 44 nautical miles of the channel in the Miocene era lime stone reef could have serious repercussion to the islands in the region and to the Jaffna peninsula. Although this had been brought to the notice of the Indian authorities and had been voiced at international fora no action has been taken to investigate it. As the construction work on the project is imminent it is prudent that the Sri Lanka government conducts an Environmental Impact Assessment of the project with the Indian Authorities to ascertain the environmental repercussions Sri Lanka may have to face as a result of the implementation of the project.

14.7.7 Development of Oluvil Port

Oluvil Port is to be located between the villages of Oluvil and Palamunai on the East Coast of Sri Lanka in the Ampara District of the North East Province. The port will be 17 km South of Kalmunai, 8 km North of Akkaraipattu. The access to the port will be through a new 4-lane roadway about 1.5 km in length from the Akkaraipattu-Kalmunai (A 4) main highway. The site is 370 km from Colombo, 34 km from Ampara and 48 km from Batticaloa. The sensitive coastline at the site is straight and may suffer the major vagaries of environmental disturbances of beach erosion and accretion, should the harbour be constructed.

In the Southeastern region of Sri Lanka comprising Ampara and Monaragala districts, agriculture, mainly paddy and fisheries are the major commercial activities. The produce of the region which is far in excess of the requirement of the region is presently is transported to the main consumption area through an inadequate and poorly maintained road network.

The desire of the Government to build a commercial port with appropriate shore facilities is to cater for the needs of the region and for the projected development in fisheries, shore based services and industries.

Feasibility studies for the development of Oluvil Port commenced in 1995 and concluded in 1999. A circuit bungalow and officers'

quarters and a lighthouse had been built by the SLPA near the port site.

The port will be constructed in two stages. Stage I will comprise a Northern Breakwater of length 549m and a Southern Breakwater of length 774m enclosing a water area of 18 hectares. A 347m sheet pile quay will be built along the Northern Breakwater for berthing of cargo vessels of 5000 DWT. Ten hectares of basin will be dredged to a depth of 8m for cargo vessels. Six hectares of the basin will be enclosed with an inner groyne of length 272m for the small craft basin. A 205m sheet pile quay wall will be constructed for small crafts and the basin will be dredged to 3m for fisheries activity.

A mixed credit fund of the Danish Government has agreed to provide financial assistance of US\$ 27 million for the construction of Stage I of the project. The construction period for Stage I is two years. The Small Craft Harbour will be available for use at the end of the first year and the berth for Coasters by the end of the second year.

The final Stage, (Stage II) would cater for 16,000 DWT vessels. The additional works to be undertaken would be the expansion of the basin area of the commercial sector of the port to 620m x 430m by excavating in land and dredging the same to depths of 11m, the construction of an additional quay wall of 470m and the ancillary shore structures.

The ports that had played a major role in the economy and transportation in Sri Lanka are Colombo Port in the West Coast, Trincomalee Port in the East Coast, Galle Port in the South coast and Kankasanturai in the Northern coast.

Colombo Port having the most modern port infrastructure facilities handles about 92.5% of the total cargo handled by all the ports, while Trincomalee and Galle Ports handle approximately 5.5% and 2% of the total cargo, respectively.

A study of the imports to Colombo port reveals that 98% of the total cargo imported through Colombo port is consigned to persons who operate their businesses in the Colombo District. This again clearly shows that a majority of our industries are located in and around Colombo Port with relatively only a few industrial activities in and around the ports of Trincomalee and Galle, which do not have the infrastructure to nurture industries.

The minimum haulage distance, which is proportional to the minimum land transportation cost from a port to the capital of a district, had been used as the criterion for the delineation of the hinterland of each port. Therefore, the master plan for port development should take into account the extent of the hinterland to be developed for the sustenance of economic activity. Accordingly, the hinterland of Trincomalee Port, comprises the districts of Vavunia, Batticaloa, Ampara, Trincomalee, Anuradhapura and Pollonnaruwa, which account for 14.4% of the total population and 9.1% of the national GDP.

Oluvil Port has not been taken in to the analysis of the hinterland, as Stage I of the project, which is to be completed in mid 2006, would cater mainly to the fisheries industry. The proposed 5,000 DWT coaster berth will not be viable in the short term as coastal transport is presently more expensive than land transport due to the lack of industries in the area to foster coastal transportation.

Recent evaluation indicates that the cost of sea transportation between Oluvil and Colombo is twice the cost of land transportation. The land transport charge for a lorry from Oluvil to Colombo is Rs.945/- per ton of cargo while sea transport cost would be Rs. 1,890/- per ton. However with the development of the proposed commercial ports of Hambantota and Oluvil, a competitive coaster service would emerge between the ports of Kankasanturai, Point Pedro, Trincomalee, Oluvil, Hambantota, Galle and Colombo, which would make sea transport more economical than road transport between the regions thereby reducing the pressure on the fragile road network of the Island. With the establishment of the coaster service between the ports of

the Island it could extend to the seaports of South India. At present 6,000T to 8,000T of cargo is landed at the Point Pedro Port from the South Indian Ports by coastal transportation.

Map 14-9 : Trincomalee Port Plan - 2030

14.8 Solid Waste Management Plan for Eastern Region

At present, solid waste generation in the region is estimated at 320 MT per day with contributions of 150, 60 and 110 MT per day from Batticaloa, Ampara and Trincomalee respectively.

The Batticaloa MC area is the major contributor to solid waste generation, estimated at 40 MT per day. Kaththankudi UC, Eravurpaththu PS and Eravur Town PS divisions, each contribute 30 MT per day to solid waste generation. The Batticaloa Fisheries and Tourism related development area consists of above mentioned local authority areas. The solid waste generation of the development area will be around 80 % of the district total. In 2010, it is estimated that entire district, BMC, KUC, EPS, ETPS will generate an amount of 215, 55, 45, 45, 45 MT per day respectively at a rate of 5% annual increase. In 2030, the generation will be 1000, 240, 200, 190, 190 MT per day by the entire district, BMC, KUC, EPS, ETPS respectively at the rate of 8 % annual increase.

Total solid waste generation in Ampara district, at present is 60 MT per day. Uhana PS area produces the bulk of the solid waste of 20 MT per day. Kalmunai MC and Ampara UC areas generate 15 and 10 MT per day respectively. It is estimated that the district will generate 80 MT per day of solid waste in 2010 and 370 MT per day of solid waste in 2030. The Ampara Agricultural, Tourism and Industrial related development area consists of the local authorities of Ampara, and Kalmunai. The Ampara development area will contribute about 75 % of the total solid waste generation of the district.

The Trincomalee UC is the largest solid waste generator in the Trincomalee district, while Thambalagamam PS and Muthur PS are the other two local authorities that generate large amounts of waste. The present and future solid waste generation of the above local authorities and the District as a whole are given below,

Year	Trinco UC	Muthur PS	Tambalagamam PS	District Total
2003 (MT per day)	90	12	3	110
2010 (MT per day)	120	18	5	150
2030 (MT per day)	575	25	25	700

The Trincomalee Industrial Port and Tourism related area includes the local authorities of Trincomalee UC, Thambalagamam PS and Muthur PS. Approximately 95 % of the total solid waste generation in the district is contributed by the development area.

14.8.1 General Objectives

Assess the need for better solid waste management with respect to the anticipated rapid development in the region

Reduce the health problems promoted by the poor solid waste management practices

Implement an Integrated Solid Waste Management Plan for each local authority in the region

Identify effective and efficient disposal methods which are relevant to the region

Create awareness among the stakeholders on solid waste management and impacts

14.8.2 Specific Objectives

To immediately implement a solid waste management plan in local authority areas, which have been identified as major generators in the region. The following local authorities have been identified as major generators in the province, Batticaloa MC, Kaththankudi UC, Eravurpaththu PS, Eravur Town PS, Uhana PS, Kalmunai UC, Ampara UC, Trincomalee UC, Thambalagamam PS and Muthur PS.

100% collection, transport and disposal of all types of generated solid waste from the three development areas.

Achieve 100 % of disposal through composting and bio gas of all organic matters and by recycle of recyclable solid waste portions generated in the three development areas of the province. Other wastes generated in the province will be disposed within the province by incineration with energy recovery and landfilling as centralized treatment facilities.

Practice 100 % source separation and household composting in all residential areas in the three development area by 2020.

To utilize all end products of solid waste management practices within the province.

To encourage industrial activities, which utilize waste as one of the raw materials. For example, the use of waste from fisheries for animal feed production and paddy husk in the operation of bio mass boilers.

14.8.3 Planning Strategy for Solid Waste Management

The strategy to be adopted in order to achieve the objectives will base on following aspects,

- National Strategy for Solid Waste Management, and
- Existing Solid Waste Management Proposals

National Strategy for Solid Waste Management

National strategy for solid waste management prepared by the Ministry of Environment and Natural Resources, deals with waste avoidance or reduction, re-use, recycling and final disposal in an environmentally friendly manner, while highlighting the adverse effects of not managing the solid waste that is generated, in an effective manner.

Waste Avoidance / Reduction

Reduction of waste generation is the first priority in the waste management hierarchy. In order to achieve this, it is required to have good public awareness as well as proper understanding of the stakeholders who produce waste. Solid waste reduction in urban areas, reduce the cost for handling, collection and transportation to a significant level. Disposal problems too can be minimized to a certain extent, by the reduction of solid waste.

Reuse

The second priority of waste management is the encouragement of people to reuse the material as much as possible. This will help to preserve the remaining natural resources, energy and reduce environmental damage.

Recycling of Waste

Recycling of waste helps to reduce waste generation. In order to promote recycling and sustainable waste collection, awareness creation is important. Recycling can be divided into two groups as follows.

1. Recycling organic fraction
2. Recycling of non-organic fraction.

Since, it is the putrifiable fraction of solid waste that leads to bad odor, produces leachate and causes loss of amenity etc., recycling of the organic fraction helps to eliminate these major environmental problems. Organic waste recycling such as composting and biogas generation can produce useful end products, which can be used in land reclamation and energy production. Biological decomposition is a natural process that began with the first plants on earth and has been going on ever since. As vegetation falls to the ground, it slowly decays, providing minerals and nutrients needed for plants, animals, and microorganisms. Composting is often used synonymously with biological

decomposition of organic matter, which can be done either under aerobic or anaerobic conditions.

Resource recovery of certain type of materials has been practiced informally over the past 20 years in Sri Lanka. A large number of persons are usefully employed in the collection of glass, paper, HDPE, LDPE, plastic, paper and metal etc. for recycling.

Final Disposal

After complete processing of the recoverable wastes, materials such as building debris, undecomposed organic material etc., which cannot be utilized in a useful manner, would have to be disposed in an environmentally sound manner. Therefore, it is vital to have a controlled / engineered landfill for this purpose.

Existing Solid Waste Management Proposals

GTZ has prepared a detailed solid waste management plan for the Urban Council of Trincomalee, Pradesiya Sabas of Kantale, Mutur, Town and Gravets, Divisional Secretary division of Padavisiripura and villages of Periyakulam and Morawewa in the Trincomalee District. Batticaloa Municipal Council has prepared a plan and submitted for the approval from the Community Environmental Improvement Fund under the Environmental Action 1 Project.

The three-level strategy will be adopted in developing and implementing the solid waste management plan.

Level 1 – The management of solid waste will be undertaken with community participation, especially through setting up community-based organizations. CBOs will operate within a defined area of a local authority and implement projects on solid waste management. The projects will be targeted to achieve the following objectives.

- Reduce waste at point of generation
- Manage organic waste at the point of generation
- Encourage separation of waste

Level 2 - Since local authorities are vested with the responsibility for solid waste management, activities at this level will focus on strengthening the local authorities. A solid waste management plan will be prepared and implemented at local authority level. The objectives to be achieved at this level are,

- Strengthen the institutional capacity of LA in SWM
- Successfully manage all wastes generated within the LA

Level 3 – Solid waste management issues, which cannot be handled at the household and local authority level will be handled at this level. Activities related to the final disposal of waste will be implemented at the district or provincial level. Final disposal of special wastes, such as hazardous and clinical wastes will be also handled at this level.

14.8.4 Proposed Projects on Solid Waste Management

Solid waste management program for households

A program will be developed to implement the solid waste management activities at household level with the help of community based organizations and non-governmental organizations. The program will focus on the reducing waste generation and separation at source, as well as increasing recycling through composting and creating awareness among public on proper SWM. This program will be initially implemented in selected areas in the local authorities within the development area and will cover the smaller waste generators. If this programme is successful, it would be duplicated in other suitable local authorities. The following activities will be carried out under the recovery phase of the plan.

- Provision of household compost bins to inhabitants
- Awareness creation on SWM among public.

- Establishing recycling networks to exploit recyclable materials

Solid waste management at local authority level

As per the strategy described in Level 2, solid waste management activities will be implemented through local authorities. This program will be designed to manage most of the waste generated within the LA. Depending on the facilities available and the quantity of solid waste generated, the LA will implement following activities under this program. These activities will commence in parallel with the solid waste management activities at the household level.

Establishing transfer stations to transfer the collected solid waste to central disposal units.

Identification of points of solid waste generation in bulk and development of suitable treatment systems to manage the solid waste at point of generation. For example, market waste can be treated through composting or biogas units at the point of generation. This will reduce the burden on the LA on SWM.

Improving the collection and transport capabilities of the LA by providing necessary infrastructure and technical support.

Regional solid waste disposal complex in Batticaloa and Trincomalee

No single method can provide a complete solution for the treatment of all solid wastes. Whatever the technology used, waste treatment would require a land fill component for materials such as demolished building parts, ceramics etc. The complete solution for the MSW problem would include the following.

- Treatment Plant for organic wastes
- Recyclable Material Separation unit for recyclable materials
- Incineration
- Sanitary Land fill for final disposal

Tentative locations for the complexes have been identified based on preliminary information, but the final locations will be determined only after a detailed site selection study and Environmental Impact Assessment. The complex will be located in a place closer to the Batticaloa town, possibly in the Western part of Batticaloa. In Trincomalee, the location of the complex will be outside of Trincomalee town. Each complex will consist of the following components.

A **manual cum mechanical separation unit**, to separate the waste into the three categories of organic, recyclable and other waste materials. Semi mechanical devices will be used in addition to manual segregation of wastes. Separation at source will be a more efficient way of managing solid waste, therefore if the objective of 100% separation at source can be achieved, only minimal involvement of this unit is anticipated.

A **composting facility** with a capacity for handling 300 MT per day of solid waste in 2010, and facility for doubling of this capacity once in every 10 years. This facility will be using windrow type technology for the processing of compost. In order to ensure the production of high quality compost, this facility will have a laboratory for quality testing. (See Map 14-10)

A **sanitary landfill** with a capacity to operate at least 25 years. An area of 30 hectares will be allocated for this purpose in the Batticaloa district after the detail site investigation. The Trincomalee and Ampara will require about 20 and 10 hectares of land respectively. The average height of the land fill will be 10 m at the end of the operation. All the landfills will have a buffer zone of at least 200 m from the footprint of landfill. Landfills are a vital component of any well-designed SWM system. They are the ultimate repository of a city's MSW after all other SWM options have been exercised. This will be designed with following features,

- Cell structure development
- full leachate and gas management

- daily and final cover
- compaction
- liners

Initially the landfill will accept only the non hazardous waste. A sanitary landfill of 10 hectares for hazardous waste will be developed in Phase III of the plan in Trincomalee. Hazardous waste to be generated in Batticaloa will be transported to this facility for treatment. (See Map 14-11)

An **incinerator with a energy recovery unit**. Incineration of MSW does not completely eliminate waste, but it does significantly reduce the volume of waste that has to be put in a landfill. There is a reduction of approximately 75 percent by weight and 90 percent by volume in solid waste after incineration. Incinerating solid waste fulfills two purposes in the advanced waste management system. Firstly, it reduces the amount of waste that goes into the sanitary landfill and secondly, it uses waste as a fuel for energy production. Several types of incineration technologies are available today, and the most widely used one is the mass burning incineration-with a movable grate or, to a lesser extent, rotary kilns. Fluidized bed incineration is still at the experimental stage and cannot be used. The mass burning technology with a movable grate has been successfully applied for decades and complies with the latest technical and environmental standards. Mass burning incineration can generally handle municipal waste without pretreatment on an as-received basis.

Initially the separation unit and composting facility will be set up in the complex under the Recovery Phase initiatives. The design for the development of a sanitary landfill can be started parallel to this activity. At the end of the Recovery Phase, the landfill should be ready for operation.

Map 14-10 Solid Waste Management Plan - 2010

Map 14-11 Solid Waste Management Plan - 2030

15 CHAPTER 15 : RECOMMENDED INSTITUTIONAL PLAN FOR THE IMPLEMENTATION OF THE SPATIAL PHYSICAL INFRASTRUCTURE DEVELOPMENT PLAN FOR THE EASTERN REGION (SPIDER)

The proposed spatial plan for physical infrastructure for the development of Eastern Province envisages implementation of various projects that may come under the direct purview of central government institutions, the provincial agencies and the local authorities. The private sector too is expected to play an important role in implementing these projects while complying with the planning guidance provided by the government.

A review of the current institutional framework operating in the region shows a highly polarized arrangement where the National (central) organizations working in the region operate independently on a specific agenda set by the respective head offices or the foreign funded project offices. The Provincial and local authorities, which are currently devoid of the political leadership (except in Ampara district local authorities), operate independently, implementing development projects where various infrastructure facilities are being designed and built. These organizations work on a schedule set by their respective parental organizations.

The envisaged plan requires a highly integrated approach and synergy among the organizations to implement the proposed projects successfully. In order to accomplish the envisioned benefits of the projects an effective institutional framework and operation of all related agencies is a fundamental pre-requisite.

15.1 Strategies for implementing the Eastern Region Plan:

After the NPPD completes its mandatory consultation of the stakeholder views and revisions (if any), the proposed plan with amendments is expected to be Gazetted under the Town and Country Planning Ordinance No 13 of 1946 as amended by Act No 49 of 2000. This process will ensure that all development agencies follow the guidance set out by the plan. However, as the plan is based on the assumption that the proposed infrastructure will be built on a time schedule to support and drive the economic growth in the region, it is important to examine the best institutional strategy that can successfully steer the implementation of the plan. We have examined two institutional strategies that can be adopted for implementation of the proposed plan. These are

Use of the existing institutional coordinating mechanisms to coordinate the implementation and monitoring of the Spatial Planning and Infrastructure Development of the Eastern Region (SPIDER): Under this option the NPPD can direct the organizations currently operating or planning to implement projects in the region to use the proposed regional plan to locate their projects and coordinate its implementation through the currently available institutional coordinating mechanisms such as Planning Meeting held by the Chief Secretary to the Provincial Council and the District Development Committee held under the chairmanship of the District Secretaries of each district. Under this option, other agencies that may not be represented in the committee can be expected to comply with the guidance and provisions of the SPIDER. The local authorities can be instructed to ensure that permission be granted (building permits) only if the proposed activity complies with the SPIDER.

Second option is to set-up an autonomous Coordinating Secretariat (CS) with financial authority to coordinate and monitor the implementation of the planned activities: This special body shall be vested with legal powers to direct all agencies operating in the region to abide by the gazetted plan and also to review and revise the plan through stakeholder consultation on a pre-set periodic basis. This CS will be responsible for setting up detailed planning guidance and providing necessary advice to the local authorities to regulate the development process according to the SPIDER. It will also facilitate the upward (with the national organizations) as well

as downward (with local governments) coordination that is essential for smooth implementation of the integrated SPIDER.

15.2 Rationale for recommending the setting up of the Coordinating Secretariat for Spatial Planning and Infrastructure Development (SPIDER) in Eastern Region:

After considering the potential problems that may be faced in implementing the proposed plan (due to institutional conflicts and for greater efficiency in use of available resources), the second institutional strategy is recommended as the preferred option. This recommendation is made following the review of similar bodies set up locally and in the region for coordinating such a wide scope of activities as proposed in this plan. In this regard the consultants briefly reviewed the institutional arrangements, mandate, strengths and weaknesses of the agencies such as Greater New Delhi Development Authority, the Greater Colombo Economic Commission, Southern Area Development Authority and the Mahaweli Authority. All these agencies were entrusted with implementation of development projects in specific geographic areas. The review revealed these agencies were established with similar objectives and achieved the targets to varying degrees of success.

Based on these past experiences we recommend that a secretariat be established under the Chief Secretary of the Eastern Provincial Council where a full time Director General is appointed to head its operations. The post should be at the Additional Secretary level, and the current Planning Division may even be converted to this proposed Secretariat. The appointed Director General will have a hand picked qualified and experienced secretariat staff with technical and administrative background necessary to carry out the tasks assigned to it. Our recommendations have been derived from lessons learnt from those institutional arrangements sited earlier and have been adopted to suit the planned development of the Eastern Region. It is essential that this Secretariat remains only as a coordinating body and does not have the mandate to implement but shall have the powers to regulate the development process in consultation with the relevant agencies. It is essential that this body does not duplicate the work of another agency but supplement it by providing the necessary support to carry out the mandated tasks of these line agencies. The tasks and recommended institutional structure and coordinating mechanisms of this autonomous body are given below.

15.3 Main tasks and mandate of the Coordinating Secretariat of the SPIDER:

The SPIDER may be established as a provision in the NPPD's gazette notification where the Physical plan (SPIDER) for the Eastern Region is to be granted a legal status. The NPPD may recommend that this be established to coordinate the implementation of this plan and be located in the ER. We recommend that this be adopted by locating within the Eastern Provincial Council as that represents the highest body concerned with spatial planning authority in the region. The Provincial Council may pass a resolution in the Council to give further strength to the Coordinating Secretariat by directing that all Provincial Ministries and the Local Government bodies comply with the Proposed Plan that will be coordinated by the CS. There will be two main mandates for the proposed CS:

- Planning mandate
- Coordination and Monitoring mandate

15.3.1 Planning Mandate:

The plan will provide broad planning guidance for the proposed land use pattern in the Eastern Region. It is essential that this plan be further developed into a series of micro plans to guide the development process in each of the administrative unit areas within the province. The coordination of the development of these micro plans with the local authorities will be one of the planning mandates of the CS/SPIDER. Secondly the CS will need to enrich itself with the data needed for updating of the current plan on a

regular basis. The CS will need to form a meta data base of the available information in the region and information links must be established with the respective agencies to access these information.

Within one year of establishment CS must try and complete the collection of all information such as resettlements needs, and the exact areas to be demarcated for specific land uses in each of the three districts, resource limitations/capacities etc. The unit may need to collect all relevant information needed for micro plans and identify the gaps so that relevant information can be collected eventually. However it shall commence the preparation of detailed plans for each of the townships (3rd order to 5th order) and agglomerations as recommended in the SPIDER. This process can be commenced immediately with the available data while the action should be initiated to prepare a GIS based meta data base of these relevant information for longer term use by the local authorities.

To implement these mandates successfully the Planning unit of the CS needs to be linked closely with the three District Secretariat's and the Provincial Council's planning units. It is therefore recommended that a planning team be set up consisting of representatives from the three planning units of the District Secretaries and the CS of the Eastern Provincial Council should assist the units in preparing these details. Ideally a Senior Physical Planner with experience in GIS and urban physical planning should head the Planning unit at the CS. The main Planning unit needs to liaise closely with the Provincial and national agencies present in the ER. However, the planning work will be decentralized into the three district secretariats so that the work relevant to each of the districts can take place under the supervision of the Planning officers of those units on guidance provided by the Planning unit of the CS. The task of the main planning unit at the Provincial Council will be to coordinate these district planning functions by providing formats for the data collection, verification of the information and collation of these district data into planning formats and prepare the final plans on a regional basis.

This planning unit of the CS should also be responsible for preparation of the annual work plans and budget preparation of the planned work must be carried out by the related agencies. The Planning Unit of the CS should be responsible for collating these individual plans and budgets into a single consolidated annual implementation plan (as indicated by respective agencies). The Planning unit of CS should ensure that these individual plans fully comply with the main SPIDER prepared by the NPPD for development of ER. If any discrepancies are detected the Planning Unit must bring such projects/activities to the notice of the relevant agencies and try to rectify the matter. The Planning Unit/CS shall be responsible for ensuring that all development plans are in accordance with the SPIDER and once approved each local authority responsible for approving building permits in the respective areas be provided with this approved plan for compliance. It is recommended that a copy of this annual plan approved be forwarded to the NPPD for its observation prior to finalization. This can be carried out annually and any modifications to the original plan if necessary can be made at this point of annual planning. However, any changes and modifications to the original plan must be backed with an analysis of how it will change the overall objectives and goals envisaged in the original plan and ideally be sanctioned by the political leadership of the Province.

15.3.2 Coordinating and Monitoring mandate:

The Coordinating and Monitoring will be the other main function assigned to the CS of the SPIDER. The CS should be entrusted with the legal power to carry out the coordinating and monitoring tasks where all relevant agencies will be required to submit progress reports on quarterly basis to the CS for monitoring purposes. A Coordinating and monitoring unit may be set up under the direct supervision of the Director General. This unit will have the required staff qualified in fields such as engineering and management, necessary for the execution of these functions.

It is proposed that a steering committee headed by the Political leadership ie the Chief Minister of the Province be formed to facilitate the coordination and monitoring task of this secretariat. In order to avoid politicizing the committee it is proposed that the Opposition leader of the Provincial Council be appointed as the co-chairmen of the committee. All national and provincial agencies that have specific role/action to play under the plan need to be mandated to participate in this steering committee process.

The SPIDER Steering Committee will deliberate on the progress of the implementation of the plan and the CS is expected prepare all background monitoring papers necessary to conduct useful coordinating meetings. The proposed membership of the steering committee shall include but not be limited to the following

- Chief Minister of the Province (Chair)
- Opposition Leader of the Province (Co-Chair)
- Chief Secretary of the EP Provincial Council (Secretary/convenor)
- Four Secretaries of the Provincial Ministries
- Director General of the CS of SPIDER
- Three District Secretaries from Trincomalee, Batticaloa, and Ampara
- Mayors of the three major urban agglomerations
- Chairmen's of each of the Local authorities in the district.
- Director of the Provincial RDA
- Representatives of the Director of the National Water Supply and Drainage Board
- Dy, Director of the Irrigations Department for three districts
- Director ER of the UDA
- Commissioner of Lands or his representative
- Representative of the Port Authority
- Representative of the BOI
- Representative of the CEB
- Representative of the Telecom Authority
- Representative of the Wildlife Conservation
- Representative of the Forest Department
- Representative of the Central Environmental Authority
- Representative of the Coast Conservation Department
- Representative of the Sri Lanka Low Land Reclamation and Development Board
- Six Representatives of the selected Non governmental organizations nominated from each of the three districts.
- Representatives of the Chambers of Commerce and Industries in the ER.
- Project Directors of all infrastructure development projects supported by various donor programs.

It is suggested that this committee meet once in two months in the first two years until the plan is launched successfully and thereafter on a quarterly basis. While the Steering Committee will be the apex body that will deliberate on the policy and institutional issues that need to be resolved in implementing the SPIDER, the Coordinating and Monitoring unit of the CS will have a secretariat to facilitate the implementation issues on a day-to-day basis. To facilitate these processes, an office will be set up with facilities to liaise with respective offices in the event an issue is brought to the notice of the CS to be addressed. The CS is expected to work in close liaison with the officials representing different agencies that will be entrusted for implementing the project activities.

It is also expected that all donor supported infrastructure development projects be made mandatory to consult the SPIDER CS prior to finalizing their plans and the proposals. In order to ensure that such proposal and plans comply with the proposed SPIDER proposals a declaration should be made mandatory for each of the project documents submitted to cabinet of minister for their approval. The NPPD or the CS SPIDER should inform the external resources department of this requirement with a request to ensure that all external assistance complies with this requirement.

On the completion of each financial year the CS SPIDER should publish an annual report outlining the progress of the implementation of the projects, activities as per plan and make a critical review of the progress made. It is expected that this review be considered as an annual audit of the progress where the shortcomings of the agencies are recorded. The agencies, which

have not completed the planned programs, should be requested to give an explanation for any shortcomings in implementation.

16 CHAPTER 16: ANALYSIS OF THE STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS (SWOT) OF THE EXISTING SITUATION OF THE EASTERN PROVINCE

The SWOT Analysis is an effective method of identifying problems and potentials in a planning exercise in a more comprehensive manner.

Strengths, Weaknesses, Opportunities and Threats have been identified and examined in the Eastern Province in terms of different sectors with the objective of preparing a Physical Plan for the region. The SWOT in this study is an outcome of the sectoral analysis of existing situation carried out by the sectoral consultants.

To carry out a SWOT Analysis consultants examined to the following questions :

Strengths:

What are advantages or potentials available to develop Eastern Province?

What are the factors that influence the development of the Eastern Province?

The identification of Strengths has been considered realistically according to the sectoral point of view and from the point of view of integrated planning .

Weaknesses:

What could be improved to develop the Eastern Province?

What is done negatively by stakeholders to keep Eastern Province undeveloped?

What should be avoided to achieve anticipated growth in the Eastern Province in the future ?

Weaknesses have been identified sectorally at the analysis stage by each consultant considering the internal and external issues involved.

Opportunities

What are the good chances available to develop Eastern Province?

What are the trends available to develop the Eastern Province?

The opportunities are used to evolve strategies in order to develop Eastern Province in the future.

Threats

What obstacles are in Eastern Province to achieve growth?

What are the possible threatening factors that will influence the development of the Eastern Province in the future?

Threats have been identified sectorally at the analysis stage by each consultant considering the internal and external factors.

16.1 SWOT Analysis of Demographic Features of the Eastern Region

16.1.1 Strengths of Demographic Features

Total population of 1.5 million with a positive growth rate of 2.19 %, which incorporated with the growth rate of Batticaloa, Ampara and Trincomalee districts as 2.49, 2.10 and 1.93 respectively. This relatively higher than the national average of 1.2% per annum in 2001.

Region consists with 70 % of the total population as active labor force, which is estimated as around One Million.

Noticeable trend of Urbanization in the areas of Batticaloa Town, Trincomalee Town, Ampara, Kalmunai, Kaththankudi, Akkaraipattu, Valaichchenai, Kantale, Pottuvil

Relatively low population density of the region 157 persons per sq km where the national average is 299.

All three major ethnic groups namely Sinhalese, Tamils and Muslims are presence in the region.

Coastal flat land along with 420 km length of beach for human settlement development (as Colombo Metropolitan Region)

16.1.2 Weaknesses of Demographic Features

Unplanned urban growth in the coastal stretch in the region especially the areas in between Valaichenai to Thirukkivil and surroundings of Trincomalee harbour.

High density of population in Kattankudy which is 19975 persons per sq km.

Poor quality of human resources such as 20000 widows and 12000 permanat disable population are in the region

Relatively low level of urban population

Cyclone prone areas, in 1970s, the worst ever cyclone almost completely destroyed the entire Batticaloa and recently in 2000, Trincomalee district heavily affected by the cyclone.

16.1.3 Opportunities of Demographic Features

Attract more population at moderate growth rate.

High agglomeration in and around of main urban areas such as Ampara, Batticaloa and Trincomalee

Peripheral township development linking Ampara, Batticaloa and Trincomalee urban centers

Human resources development on agriculture and industry, since the livelihood in the region is mainly depend (about 50 % of the population directly involves) on agricultural and fishing activities, opportunities

Encourage in-migration from other areas of the country

16.1.4 Threats of Demographic Features

Ethnic and religious divisions – present conflicts among the ethnic groups is the major threat considering the demographic feature of the region.

Caste and cultural reasons

16.2 SWOT Analysis of Landuse and Environment Features of the Eastern Region

16.2.1 Strengths of Landuse and Environment

Rich natural resources of the province. Details of the land use pattern is described in the following table,

Land Use	Region	
	Ha	%
Builtup	3211	0.32
Agricultural	227936	22.87
Natural landscape	555356	55.73
Irrigation tanks	54752	5.49
Waterbodies	39813	4.0
Wetlands	12450	1.28

Relatively flat terrain.

Availability of developable lands. Marginal lands (Scrub lands) which can be utilized for development activities are 25.12 % of the area of the region.

Relatively Low population density. Only 7.32% of the total land is covered by urban settlements.

Rural settlements covers 7.0% of the Total area

Predominantly agricultural land, 22.87 % of the total land is used for paddy 917.74%, Chena 1.35%, Coconut 0.58% and Other plantations 3.20%.

Relatively large agricultural land plots more than 60% above 2 acre plots

32 out of 103 rivers flow in the province. 9.2% land is covered by tanks and waterbodies (Mahaweli Ganga Stretch, Verugal Ganga , Yan Oya, Valachaniai Aru, , Kambunda Aru, Anedella Oya, Mara Oya, Maduru Oya, Pulliyanpotha Aru, Elakatoliya Oya etc..)

Relatively high land-man ratio.

Availability of scrub jungle about 10% of the total land area of the region. This can be utilized for cultivation of sorghum, pasture, commercial timber production and bio mass for dendro power generation.

Conducive climatic conditions – locating in the dry zone of the country and sunlight available for all nine months annually and comparatively high rainfall in rest of the three months.

Archeologically and culturally important sites Lagoons, Wetlands and the beach (21% of the country's coastal areas, white beaches, sand dunes, mineral sand, lagoon system, sandy coast)

Coastal stretch of 420 km , with bays, lagoons and islands tanks)

Location of natural harbour. Trincomalee is most significant natural harbour in the world and it's famous for its natural location with deepness of the sea.

Available of extensive bio diversity and natural resources. Forest and wildlife, water bodies, lagoons, bays, wetlands, mangroves and marine resources are located within the region.

Location of wildlife nature reserves and forest and marine sanctuaries. A list of reserves located within the region are given below.

	Name	Status	Area
1	Yala east (Kumana)	NP(National park)	181 km ²
2	Kudimbigala	SA(Sanctuary)	44
3	Lahugala	NP	15
4	Sagamum	SA	6
5	Gal oya	NP	258
6	Gal oya NE	SA	124
7	Gal oya SE	SA	152
8	Senanayake samudra	SA	93
9	Buddangala	SA	18
10	Seruvila Allai		155
11	Trincomalee naval headworks	SA	Na
12	Grest sober island	SA	0.65
13	Little sober island	SA	0.05
14	Pigeon island	SA	0.04

Large extent of land is owned by State Agencies

16.2.2 Weaknesses of Landuse and Environment

National policy to strengthen the Colombo port

Lack of water for development – water bodies in the region are rain fed and ground water availability is limited in most of the rural areas in the region.

Lack of an appropriate land policy

Predominantly rural settlement areas

Inadequate infrastructure facilities in rural areas – basic infrastructure facilities such as road, water supply and sanitation,

electricity and telecommunication facilities are not available at present.

Ad-hoc land development in settlement areas – Areas like Kaththankudi, Eravur, Kalmunai, Pottuvil are being developed without any long term plan.

Poor quality of Agricultural production – Agricultural products mainly productivity (3 – 4 MT / ha) of the paddy which the region produces 20% of the country's requirement is below the average (8 MT / ha)

Chena Cultivation 1.3% of the land is used for Chena cultivation.

Subsistence agriculture

Inadequate accessibility in rural areas

Low-lying areas under seasonal flooding – since the higher rain falls within the three months of rainy season low lying areas in the region especially Ampara and Batticaloa are affected often.

Abandoned tanks – Network of tank systems were blessing to the region in order to manage the water resource but due to the abandon of tanks system is collapsed and leads to the destruction of water resource.

Inadequate irrigation water

Land fragmentation – Due to the cultural and traditional reasons land fragmentation of agricultural lands especially in the built up areas of the region lead to loss productive agricultural lands.

Abandoned paddy lands

Encroachments of the environmentally sensitive areas- Forest lands in the region are under risk of chena cultivation, unplanned development activities.

Housing development in conservation areas and reservations

Low attention on tourism and fishing sectors.

16.2.3 Opportunities of Landuse and environment

Develop as a Regional Port in Asia – Trincomalee could be developed as a regional port by expanding the capacity and improving the infrastructure facilities.

Opportunity for urban agglomeration (like in Western Province) – The favorable living conditions such as flat terrain, coastal beaches, proposed development plans will facilitate the urban agglomeration in the areas of Ampara, Batticaloa and Trincomalee.

Creating new urban settlements

Availability of lands for commercial agriculture – 25.12% of the marginal lands and unproductive agricultural lands can be used for this purposes.

Urban Development

Industrial Development – Mineral resources in Pullmoddai, unexplored resources in the sea, agricultural products like paddy, milk and aquaculture and fisheries products available in the region have ample potential for value addition.

Encourage migration of population into the Province

Commercial Agriculture

Land suitable for agro based industrial development

Expansion of residential land development

Development of energy (Dendro plants) – Bio Mass energy and wind energy – Available marginal lands (17 %) can be utilized for the bio mass production for dendro power generation. Batticaloa is

one of the areas identified as suitable location for wind power production.

Livestock development – livestock population in the region has been grown more than two fold despite the war situation but the opportunities are there to increase the productivity and value addition activities.

Develop Eco tourism Cultural and leisure tourism – Forest cover of the region (29.2% of the land) can be utilized for eco tourism, existing natural reserves (mentioned above) and coastal beaches (especially Nilaweli, Vakarai, Pasikkudah, Arugambay) have the opportunities for development of conventional tourism activities.

Timber based industries – Available marginal lands and unproductive or destroyed forest lands can be used for commercial timber cultivation, this will lead to the development of timber based industries in the region.

Setting up Harbour based development – Since the region have the natural harbour and planed Oluvil harbor, shipbuilding and repairing, bunkering and other harbor related opportunities could be explored.

Establishment of mineral based industries,

Establishment of Coal power plant – Studies have been completed for setting up a coal power plant and later that was abandoned due to several reasons. This plan can be further studied and implemented because Trincomalee has been identified as potential site for the plant.

Fishery tourism (whales, surf) – Whale watching at Trincomalee beaches experienced and enjoyed earlier and this can be developed with the tourism development.

Marine based tourism

Aquaculture and Shrimp farming and hatcheries

Cashew and coconut plantation

Sugar cane/ irrigation settlement

Develop Port as industrial base port

Fish processing and canning industries

16.2.4 Threats of Landuse and environment

International interest - Since the strategic location of the Trincomalee harbor in the region creates political interests of other countries.

Socio Cultural Implication - Presence of three different ethnicities in the region lead conflicts due to the socio cultural aspirations of the people.

Encroachment on state lands

Acquisition of Land and development

Encroachment on state lands

Local and regional political involvement

Institutional Implications – Due to the war situation the institutional setup has weaken and need to be strengthen

Security situation

16.3 SWOT Analysis of Economic Features of the Eastern Region

16.3.1 Strengths

Low population density compared to national population density. As per 2001 Statistics the population density per sq.km. for Batticaloa, Ampara and Trincomalee districts are 186,140 and 135 respectively. This is lower than the National figure of 299 persons per sq. km.

Agriculture development

Trincomalee harbour, a natural harbour, which is located in a strategic point in the Indian Ocean, has tremendous development potentials.

Natural landscape and cultural landscape for promoting eco-tourism and cultural tourism.

Strong regional linkages

Coastal habitat and fishing grounds

This harbour is located closer to major international shipping lines, and therefore has access to global trade links.

16.3.2 Weaknesses

Dispersed population settlements with no locations of substantial population concentration.

Weak urban infrastructure facilities compared to the other districts. This is mainly due to the war situation prevailed in these districts for last twenty years.

Agriculture based economy with very limited marketable surpluses of most crops grown in the area.

16.3.3 Opportunities

Port related development activities (Commercial, Industrial and recreational port activities).

Industrial development potentials in Trincomalee area.

Fisheries and tourism related development activities especially in Batticaloa and Ampara castal areas.

Agro based industrial development in Ampara.

Diversification of agriculture and livestock development- more commercial orientation.

Development strategies/plans can be implemented effectively as there is low population density. This will also help to build up a substantial economic base.

Trincomalee harbour, which currently remains highly underutilized harbor can be developed as a leading harbor in the South Asia.

Availability of substantial water resources and land could facilitate in developing agricultural sector.

Industrial sector can also be expanded, since there is adequate land and water resources.

16.3.4 Threats

Uncertainty about the communal harmony could drive both local and foreigninvestors away from the district.

Competition from other harbors in the Asian region such as Mumbai, Tuticorn, Chennai could reduce the importance of the Trincomalee harbour.

Investment demand from other provinces could reduce the inflow of investments to the district considering the factors such as proximity to the seaport, airport, availability of infrastructure facilities and market accessibility.

16.4 SWOT Analysis of Social Infrastructure Features of the Eastern Region

16.4.1 Strengths

Social infrastructure is fairly well distributed according to the population distribution.

Some of the health care facilities such as laboratory facilities, cleaning and sanitation, supply of food etc which are currently under the funding and control of the government, considered to be outsource to the private sector.

The health care network can be used as an entry point .

Currently the monitoring of growth rate of infants and preschool children are being carried out. Assessment of height and weight and nutrition levels, are being done in school medical inspection sessions.

Nutrition advices are given at the government health clinics, and also by the family health officers during their home visits.

The contribution of the International NGO's such as UNICEF, ZOA, OXFAM to uplift the living conditions and social infrastructure in the region.

School mid-day meal program has improved the school attendance.

Average life span and other primary health indicators show a healthy living condition in the district and therefore productive human resources.

Food consumption patterns are generally good because of the subsistence agricultural system and fishery industry. But distribution and access to the nutritional food in the remote villages are unsatisfactory.

Most health institutions are located in accessible points of main roads and telecommunication facilities. Therefore improvement to these infrastructure facilities will have a direct impact on the services provided by these institutions.

Number of Schools, teachers and student population has increased significantly despite severe constraints experienced due to war conditions.

Student enrolment in schools is satisfactory and dropout rates are relatively low in urban centers compared to peripheral areas. Most schools in urban areas have trained and graduate teachers.

Majority of schools have moderate teacher-student ratio (1:30) compared to other districts

Urban council area of Trincomalee has basic recreational facilities that can be improved with low cost and community participation.

16.4.2 Weaknesses

Health sector has deteriorated severely over the past two decades due to war situation in the area. Currently the services of health sector are being affected by lack of staff, medical equipment and medicine and inadequate physical infrastructure such as electricity, telecommunication facilities etc.

Except play grounds and community centers, other recreational facilities are grossly inadequate in rural areas.

Operation and maintenance of recreational facilities at local level are not properly executed.

Annual budget expenditure for the social infrastructure have not properly utilized and indicate only 40% to 60% physical progress during the past years.

Educational level of children are severely affected due to war situation prevailed in the area for last two decades.

Adequate numbers of teachers are not available in primary and junior level schools in the remote areas.

Most schools are damaged or less equipped to conduct modern education. Some schools need repairs and renovations. It has been observed that students of some areas do not have basic facilities such as school buildings, furniture, equipment, drinking water etc.

Even some central and urban schools do not have laboratory and other facilities for science education.

Literacy rate of the district is far below national levels. (District literacy level is 80% compared to national level of 87%).

Acute shortage of basic facilities such as classrooms, latrines, water supply etc in rural schools.

Lack of proper quarters facilities for teaching staff and incentives for better teaching conditions.

Lack of adequate medical and support staff in Hospitals.

Poor infrastructure facilities and incentives to retain medical staff.

High level of malnutrition among children in remote villages.

16.4.3 Opportunities

Social infrastructure facilities can be improved because of the keen interest and dedication of state governing bodies.

A properly plan human resources development program can be implemented.

A large number of donors, humanitarian agencies, NGO's are working in the area of social infrastructure development.

Possibility to strengthen the base hospitals of Province as provincial hospital.

Possibility of strengthening the peripheral hospitals.

Establishment of Gramodaya Health Centers.

Strengthening of infrastructure facilities to attract medical staff. Possibility to expand the safe drinking water and sanitary facilities.

Possibility of launching nutrition and food security program with UNICEF, GTZ, NEAP and other social development agencies.

There is a possibility to implement social development programs even in the militant controlled areas with the support of international development agencies.

Program to mobilize community for planning and implementation and management of social infrastructure.

16.4.4 Threats

Due to various legal and security restrictions the construction and development of social infrastructure get delay

Due to lack of disease prevention and preparedness such as anti malaria the spread of diseases very high in the district

Still several schools in the province are not functioning due to conflict situation

Poor participation of communities and lack of effective local institutions to sustain social development interventions

High incidence of poverty and malnutrition in peripheral areas and too much dependence on external support for living

Inefficient social service delivery system such as postal, relief and rehabilitation activities

Duplication and overlapping agendas and activities by various government and non-government organizations

16.5 SWOT Analysis of Physical Infrastructure Features of the Eastern Region

16.5.1 Strength : Water Supply, Drainage and Sanitation

Availability of water sources such as perennial rivers (out of 103 rivers 32 are in EP) and cascade of irrigation tanks.

Untapped and under utilized resource base in the province is a significant strength in the development of water supply facilities.

Ongoing schemes to provide water supply to coastal areas in Ampara district

Comparatively high rainfall in the three months during the North – East monsoon period

16.5.2 Weakness : Water Supply, Drainage and Sanitation

Availability of safe water supply is poor. The proportion of households that have access to safe water supply is only 20 percent as compared 45 percent nationally.

The capacities of local authorities who are responsible for the O&M of smaller town schemes are limited, and need strengthening.

Poor access to the sanitation facilities, the percentage of households who have access to sanitation is 25 per cent compared to the national average of 72 per cent.

No proper drainage system is available almost all built up areas in the region

16.5.3 Opportunities : Water Supply, Drainage and Sanitation

Supply of pipe born water for urban areas.

Encourage more urbanization – high density development

The inadequacy of the existing facilities and the desperate need for having these basic needs is a motivating factor to obtain community participation and cost sharing contributions to establish facilities.

The national and international response to the need to consolidate the peace process and achieve a lasting peace to the region. This is demonstrated by the commitments already made to undertake a massive rehabilitation and reconstruction program with external donor assistance.

16.5.4 Threats : Water Supply, Drainage and Sanitation

Poor water supply and sanitation situation lead to destruction of scenic beauty and tourism potential areas like Nilaweli, Pasikkudah and Arugambay.

16.5.5 Strengths : Solid waste

High percentage of organic components in the solid waste. About 60 – 70 % of the waste is organic nature

Land availability for collection, transmission and disposal of solid waste in the region.

Less complexity in characteristics of the solidwaste. Since no major industries are in operation generation of hazardous waste is minimal.

Already available solid waste management plans and proposals prepared by the NGOs and Local authorities.

16.5.6 Weaknesses : Solid waste

Resources available for the solid waste management operations are minimal with the local authorities.

Negligence attitude of the people as the solid waste has been identified as secondary issue compared to the other livelihood issues experienced during the war situation.

Short term approach by the officials on disposal of solid waste. Disposal through open dump has been accepted as end of the solid waste issue in most of the time.

16.5.7 Opportunities : Solid waste

Conducive environment for composting which will be the ideal disposal method of organic part of the solid waste. Since agricultural activities are high in the region demand for the compost is high.

Implementation strategies of the planned and proposed solid waste management schemes can be incorporated into the development plans which are being planned at present.

16.5.8 Threat : Solid waste

Implementation of development plans will lead to the generation of hazardous and pathogenic wastes, which the region need, engineered landfill and incineration facilities

16.5.9 Strength : Energy and Telecommunication

Availability of fairly extensive electrical network.

Largest petroleum storage facility (oil tank farm : 100 tanks with the capacity of 20000 pounds per tank)in the country which situated in Trincomlee town.

Natural harbour at Trincomalee

Availability of lands for power generation.

Use of alternative energy sources such as solar panels and wind power

Private sector involvement in power generation and telecommunication

Favorable government policy on energy generation and telecommunication

Potential demand for telecommunication and information technology in urban areas of the Eastern Province

16.5.10Weaknesses : Energy and Telecommunication

Low population density in most areas, isolated dwellings that need high capital cost for the transmission and distribution of electricity.

Lack of institutional capacity to manage the electricity supply.

Poor demand in rural sector

Opportunities : Energy and Telecommunication

Available of land to grow renewable energy sources such as biomass for dendro, solar and wind.

Impetus in development of ICT Island wide.

Establishment of coal fired power plant in Koddar Bay in Trincomalee

16.5.11 Threats : Energy and Telecommunication

Abuse of electricity supply, illicit connections are identified as major threat since law and enforcement have been carried out in low profile.

16.5.12 Strength : Transport

Availability of railway line to Trincomalee and to Batticaloa

Relatively flat land good for construction of roads.

Roads radiating from the City of Trincomalee to other parts of the country.

Strong regional linkages from Trincomalee and Batticaloa with the rest of the regions in the country.

Direct access to City of Colombo from Trincomalee

Three domestic Airport are available in Ampara, Batticaloa and Trincomalee town centers can be utilized for domestic civil aviation and tourism.

Natural port at Trincomalee

Deep sea along the Eastern Coast for maritime navigational purposes.

16.5.13 Weaknesses : Transport

Under utilization of the railway

Poor road design and management leading to Congestion in Trincomalee Towns

Lack of overall traffic management policy, particularly for Parking, Pedestrians and Bicycles in urban areas

Resulting poor connection between rail and bus

Inadequate carriageways of main highways

Poor accessibility in the western part of Batticaloa and Ampara.

Utilization airports only for military purposes.

Poor physical condition of all A and B class roads

16.5.14 Opportunities : Transport

Optimising the utilization of available railway capacity

Extention of the railway line to Ampara and potuvil.

Development of business, tourism and freight travel

To attract more population from the other regions in Trincomalee and Ampara and Batticaloa metro regions through the radial roads.

Creating strong linkage between Colombo, Dambulla, Anuradahapura, jaffana, Ampara and Baticoloo,

Potential for airport development for domestic freight.

Use maritime route for passenger transportation and goods transportation.

Construction of highway from Ampara to Trincomalee to creae direct access.

16.5.15 Threats : Transport

Resistance for land acquisition needed for road improvements

Limitation of transport sector agencies for funding/executing improvements

Lack of support from local policy makers regarding priority of public transport in town development

17 CHAPTER 17 : ACTION PLANS AND PROPOSALS

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas	
Agriculture	Productivity Improvement Measures	The present yield in the region varies from 3 to 4.5 Mt / ha. This yield level can be increased to 6.0 – 6.5 Mt / ha in the high potential major irrigation areas under this project						
		Productivity improvement of irrigated rice farming in the high yield potential areas in the eastern region as listed (all three districts)	I		In high potential areas			
		Modernizing rice mills to increase output and rice quality	I					
		Organic farming integrated with solid waste composting projects	I		Pullumalai, Kaluthawalai, Kuchaweli, Sammanthurai, Pottuvil			
		Chillie and Maize programme to increase average yield	I					
		Expansion of cashew cultivation especially in Batti district	I					
		Establishment of farmer companies at every Agric. Service Centres	I					
		Agricultural Productivity Villages	I			In selected areas in 3 districts		
		Cashew, Coconut and Casurina Plantation	I				20000 ha in Vakarai, Mankerni	
	Support Services	Provide storage facilities to maintain buffer stocks in all three districts rehabilitation of existing storage facilities Storage cocoons in each agriculture service center New storage facility for seed paddy	I			All agrarian service centers of the high potential areas		
		Agro-well development , micro irrigation development	II					
		Establishing soil testing laboratories in all three districts (these will do the fertilizer recommendations (can be private)	II			Sammanthurai, Karadiyanaru, Trincomalee Town		
		Facilitate farm machinery centers – 17 centres – privately run	II			17 centres		
		Economic center in Ampara	I					
	Training, Research and Development	Renew and revive agricultural research centers at Karadiyanaru and Samanthurai	I			Karadiyanaru, Sammanthurai		
		National Agricultural training centre	II					
		Improve Hardy Agricultural school – Ampara Comprehensive agri training school	I			Ampara		
	Value Addition	Processing centers for Horticultural crops (private sector)	II			Trincomalee Batticaloa Ampara		

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
		Development of rural level Agro processing enterprises	II				Ampara
		Programms to encourage oil seed production	II		Trincomalee Batticaloa Ampara		
Irrigation		Rehabilitation of existing irrigation tanks	I		All irrigation systems		
		Rehabilitation of agricultural access roads	I				
		Heda Oya irrigation scheme	II		Said area		
		Rampunkkan Oya Reservoir Scheme	II		Said area		
Tourism	Coastal Tourism	Urban recreational beach front development in Kalmunaai, Pasikuda – Kalkuda, Okandamalaie – Ampara, Panama – Ampara, Kallady – Batticaloa, Punnaiudah – Eavur – Kaluwankerny – Batticaloa , Thena Bay – Elephant point, Vakara	I			Said areas	
		Integrated tourism development in Arugambay, Nilaveli, with Pasikudah resorts and water related recreational facilities	I			Said areas	
		Water front development, Batticaloa lagoon, Senanayaka samudraya	II			Said areas	
		Marinas	III				Trincomalee
		Beach Parks	II				Batticaloa Ampara
	Eco Tourism	Rehabilitation of mangroves – Sathurukandan (batticaloa)	I			Said areas, Batti lagoon, Vakara, Panama, Periyakulam Uppuveli	Batticaloa Ampara Trncomalee
		Development of wild life corridor	II			Linking of fragmented forest patches – Maha Oya, Punani	
		Development of urban Botanical gardens	II			At least one per district	Trincomalee Batticaloa Ampara
	Cultural and Heritage Tourism	Cultural centers, Fort Fredrick, Buffalo island Heritage tourism	I			Said areas	Trincomalee Ampara
		Develop a Herbal Resort, Ayurvedic hospital with health tourism Herbal Park	II				
Tourism Support Services	Tourist information centers /visiting center	I					
	Training facilities in tourism and support services	I				Batticaloa Trincomalee	
Water Supply and Drainage		Greater Batticaloa water supply project	I				Batticaloa
		water supply in secondary care hospitals	I				Trincomalee
		Water resources improvement project – ground water recharge	II				Ampara

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
		Storm water drainage Improvement project Karavaku Drainage Scheme Periyakalappu drainage scheme	I				
Sewage		Sewerage system in secondary care hospitals	I				Batticaloa
		Pipe borne sewerage project	III				Trincomalee
Solid Waste		Integrated Solid Waste Management Program has to be developed, planned and implemented (guidelines)	I				Trincomalee Batticaloa
		Utilization of waste material (f.e paddy husk, slaughter house waste) in industry	II				
Port		Port development Phase I – Development of water front Small scale ship repairs and export oriented light industries – Boat building Cargo handling and bunker Entreport trade and value adding Tourism – cruise vessel terminal	I				Trincomalee
		Phase II – Dry bulk handling Petroleum refinery - ,, Liquid bulk handling ,, Dry docking - ,, Heavy industries - ,, and industrial Zone	II				Trincomalee
		Oluvil – phase I Fisheries harbor and coaster harbor 5000DWT	I				Batticaloa
		Phase II Small scale commercial harbor – 16,000 DWT	II				Batticaloa
Industrial		Light industries and industrial township	I				Trincomalee
		Agro-based industrial estate					Ampara
Animal Husbandry		Development of live stock development farms through farmer companies at least one in each district (based on this can have a great impact on yield per unit of animal – higher production and growth rate can be envisaged. Bio technology also can be incorporated in the production of improved live stocks/products	I		Rural settlement areas in Ampara, Batticaloa and Trincomalee		
		Establishment of feed mill to produce compound feed for poultry and cattle –(based on the poultry population (highest) and egg production	II				Ampara
		Large scale milk and meat processing industries to be established - location one in each district	II				Ampara Trincomalee Batticaloa
		Fisheries harbor complex at Valachchenei	I				Batticaloa
		Oluvil Fisheries Housing project	II				Batticaloa
		Rehabilitation of the existing fisheries harbor	I				Batticaloa Trincomalee

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
Fisheries and Aquaculture		Fisheries infrastructure improvement project Valachchenei – phase I Rehabilitation of existing fisheries harbor	I				Batticaloa
		Rehabilitation of damaged 10 ton ice plants, machinery, fish storage processing unit at Rest house road, Kalmunai	I				Ampara
		Rehabilitation of Cey Nor boat yard ice factory, cold storage processing unit, canning- Kaluwankerny	I				Batticaloa
		Rehabilitation of oc cold storage, fish processing unit 5 ton ice plants, Batticaloa, Lake road II, Kallady	I				Batticaloa
		supply of fishing gears – vessels to replace the damaged gear etc to fisherman from Trincomalle, Batticaloa and Amparai	I				Trincomalee Batticaloa Ampara
		Training divisions in Trincomalle and Batticaloa (Navalady) to do training along with updating instruments	II				Batticaloa Trincomalee
		Ancorage facilities – Batticaloa, Trincomalee, Amparai	I				Trincomalee Batticaloa Ampara
		Net fishing production and sale outlets – 3 districts Boat yard – 3 districts	II				Trincomalee Batticaloa Ampara
		Breeding center for brackish water organisms – Batticaloa, Amparai, Trincomalee	I				Trincomalee Batticaloa Ampara
Power and Energy		Power generation and distribution project – Coal and LNG	II				Trincomalee
		Power generation (Koddigar bay harbor)	II				Trincomalee
		Alternate power generation projects - solar , wind, Dendro 6Mw	I			Many marginalized forested area, Karadiyan aru, tirukovil, Kuchaweli	
Telecom		Increase the telecommunication coverage to rural	I				Trincomalee Batticaloa Ampara
		Internet facilities	I,II				Trincomalee Batticaloa Ampara
Road and Transport		Rehabilitation of internal roads	I			Trincomalee Batticaloa Ampara	Trincomalee Batticaloa Ampara
		Rehabilitation of ferry services	I				Trincomalee Batticaloa Ampara

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
		Sea transport from Olluvil to Trincomalee	II				Trincomalee Batticaloa
		Road connecting Ampara, Batticaloa and Trincomalee through western Batticaloa	II				Trincomalee Batticaloa Ampara
		Airports	III				Trincomalee Batticaloa Ampara
		Construction of north south highway	II		Trincomalee Batticaloa Ampara		Trincomalee Batticaloa Ampara
Housing		High income housing – 1000 units	I				Trincomalee Batticaloa Ampara
		Middle and lower middle housing	I				Trincomalee Batticaloa Ampara
Industry		Industrial townships	II				Trincomalee
		Rehabitation of existing small & medium scale industries – all over province	I				Trincomalee Batticaloa Ampara
		Value added processing industries – all over province	II		Trincomalee Batticaloa Ampara		
		Agro industries, food processing, horticulture , seeds – Amparai, Batticaloa	II				Batticaloa Ampara
		Port related industries – small export orientd industries – cement packing - Trincomalee Industrial part – Trincomalee Fertilizer mixing and cement mixing	II				Trincomalee Batticaloa Ampara
		Mineral sands – value addition - Trincomalee Sugar industry expansion Paper mills modernization Mineral processing Port related industries	II				Trincomalee Batticaloa Ampara
		Export development industries	III				
Health		Development of teaching hospital in Batticaloa	I				Batticaloa
		Cancer services in Batticaloa	I				Batticaloa
Education		Campus town linked to the university in Eastern and South Eastern Universities with agricultural/ natural resources based research centers	I				Batticaloa Ampara

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
Environment		<p>Eastern Region Forestry Development Program</p> <p>Establish nurseries</p> <p>Reforestation program in areas where man interventions have destroyed forested areas in the past (plantation and natural regeneration) Ottamavady – Welikanda, Habarana – Batticaloa</p> <p>Mapping and demarcation of forest areas in the region</p> <p>Identify areas that can be brought under firewood plantation in 3rd 4th and 5th order towns using small size scrublands. Larger plantations to be developed in are of power stations</p> <p>Study the migratory patterns of animals and establish a corridor protecting the forests</p> <p>Transition of forests into agricultural lands to be brought under production forestry in the transition zones in order to protect the forested areas</p>	I	Trincomalee Batticaloa Ampara			
		<p>Wetlands and coastal habitats</p> <p>Coastal set-back are demarcated and strictly followed in development projects</p> <p>Extension for the past Wetland Project to the Easter Province, in order to identify and demarcates wetlands in the Eastern Province and implement programs to conserve them with participation of stakeholders.</p> <p>Riverine Protection Program: f.e. riverine forests would be forested using cumpuk, mee, bamboo and other riverine species</p> <p>Identify suitable land for aquaculture (zonation)</p> <p>Coastal zone planting can use cashew coconut and casuarinas appropriately</p>	I			Trincomalee Batticaloa Ampara	
		<p>Urban Environment Improvement Program</p> <p>10% tree cover should be maintained in 1st and 2nd order towns as urban forests</p> <p>Botanical gardens to be developed in Trincomalee, Batticaloa preferably lagoon based (mangrove botanical garden)</p> <p>Access to an environmental laboratory for environmental tests</p>	I				Trincomalee Batticaloa Ampara
Resource Study		Study the requirement of sand and explore off-shore mining	I			Trincomalee Batticaloa Ampara	
		Study the requirement of granite	I	Trincomalee Batticaloa Ampara	Trincomalee Batticaloa Ampara		
		Study n Industrialization potential for EP	I				Trincomalee Ampara
		Explore possibilities of renewable energy (wind power, solar energy and dendro power) and development of these studies	I		Trincomalee Batticaloa Ampara		
		Develop a wind profile for Eastern Province	I			Batticaloa Ampara	

Sector	Sub sectors	Type of Action Projects	Phase	Wild life rich forest and wetland ecosystems Conservation Area	Agricultural Production and rural settlement Area	Coastal and Marine Area	Development Areas
		Study of water supply from Kanthalai Tank for domestic and industrial purposes and recommendation thereto without affecting paddy cultivation	I				Trincomalee
		Study on productivity enhancement in the irrigation schemes	I				
		Study on the Mahaveli water being irrigated for paddy lands in the Trincomalee district and the future proposals and recommendations thereto	I		Trincomalee Batticaloa Ampara		
		Study of proposed water supply from Unnichchai tank for domestic and industrial purposes and recommendations thereto without affecting paddy cultivation	I				Trincomalee Batticaloa Ampara
		Study on the Augmentation of the following irrigation schemes Amalgamation of Kithulweva with Rugam tank Pulugunawa tank with Ponnankernicheni tank Katumurivu tank Adachchakal tank	I		Batticaloa Ampara		

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