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POLICY PROPOSAL FOR SIHANOUKVILLE PORT DEVELOPMENT IN THE KINGDOM OF CAMBODIA

By

LENG THUN YUTHEA
Kingdom of Cambodia

A dissertation submitted to the World Maritime University in partial fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE

in

GENERAL MARITIME ADMINISTRATION AND ENVIRONMENT PROTECTION

Year of Graduation
1995

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I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflects my own personnel views, and are not necessarily endorsed by the University.

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Port consultant and author
I Dedicate This Work
To
My Late Mother Pok Kim Houy
Whose Living Spirit Has Been A
Guiding Touch
In My Every Day Life
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ABSTRACT

Title of Dissertation: Policy Proposal for Sihanoukville Port Development in the Kingdom of Cambodia

Degree: MSc

As the title implies, this dissertation is a study of port development policy which development of Sihanoukville Port can follow and be implemented. It contains six Chapters with a comprehensive information with respect to port organisation, management, operation and legislation from end to end.

First of all, a general view of the Kingdom of Cambodia is given including the general status of the country, its economic development and trade. In addition, a brief description of the transport system such as road system, waterway, railway system as well as the airway system, is also made.

As far as Sihanoukville Port is concerned, a brief look is taken at its existing organisation, management and operation as well as the legislation. The limitation of responsibility and right of the port authority, the roles of the Ministry of Public Works and Transport including the involvement of related authorities are also investigated.

All outstanding problems concerning the organisation, management and operation as well as legislation are also identified and examined taking into account the involvement of other related authorities.

Furthermore, the aforesaid problems including cargo traffic evolution are analysed and assessed taking into consideration the economic situation, security as well as social factors of the country.
Additionally, a comprehensive forecast and outlook into the possible future potential of Sihanoukville Port are made having considered the environmental aspects as well as the overall policy of the government regarding Sihanoukville.

Finally, the proposal for development of Sihanoukville Port is recommended. It thereinto contains the improvement/modification of existing organisation, management, facilities, equipment, operation and the legislation.
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<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>Cambodia</td>
<td>Kingdom of Cambodia</td>
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<tr>
<td>CAMSAB</td>
<td>Kampuchea Shipping Agency &amp; Broker</td>
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<tr>
<td>CAMSIN Co.</td>
<td>Cambodia-Singapore Logistic Corporation</td>
</tr>
<tr>
<td>CFC</td>
<td>Royal Cambodian Railway</td>
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<td>CKC</td>
<td>Cambodia fuel Company</td>
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<tr>
<td>CMEA</td>
<td>Council for Mutual Economic Assistance (Moscow)</td>
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<tr>
<td>FEU</td>
<td>Forty Feet Equivalent Unit</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GRT</td>
<td>Gross Registered Ton</td>
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<tr>
<td>IMDG Code</td>
<td>International Maritime Dangerous Goods Code</td>
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<tr>
<td>MARPOL</td>
<td>Marine Pollution Convention</td>
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<tr>
<td>MPWT</td>
<td>Ministry of Public Works and Transport</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OPRC</td>
<td>International Convention on Oil Pollution Preparedness, Response and Co-operation</td>
</tr>
<tr>
<td>SOLAS</td>
<td>International Convention for the Safety of Life at Sea</td>
</tr>
<tr>
<td>SRAP</td>
<td>Special Rehabilitation Assistance Project (financed by ADB)</td>
</tr>
<tr>
<td>TEU</td>
<td>Twenty Feet Equivalent Unit</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>USSR</td>
<td>The Union of Soviet Socialist Republics</td>
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<td>US$</td>
<td>United States Dollar</td>
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INTRODUCTION

During the last quarter century, and particularly the last 20 years, the many social, political and technological changes involving the economic development approach including international, regional as well as national, all modes of transports have required accompanying changes.

Among them, port which acts as an intermediate means of transport between rail, road, air and sea is also in the position of both technical and organisational change. The old methods of conducting international trade where the ship can afford to spend several days anchored offshore while cargo is lightened to and from the vessels is rapidly disappearing. Economically feasible, they must give way to modern methods of cargo handling.

The world’s cargo carrying ships are being built larger, faster and more sophisticated and specialised. The cost of constructing such vessels make it imperative that they spend as little time in port as possible, for a freight carrier earns income only when it is transporting freights. Ports must provide modern piers facilities, extensive upland areas, adequate channels and properly trained workers if they hope to keep the transport cost for their country’s exports and imports. Failure to provide them will mean penalty freight rates.

As a new country emerges from colonial status as well as a prolonged warfare to the political independence and stability respectively, economic progress of the Kingdom of Cambodia increasingly depends upon the international trade which moves through its ports. Without an efficient ocean gateway, the flow of raw materials, agricultural products and finished goods is retarded with a consequent stiffing effect on national prosperity. Frequently, the ports currently used are no longer adequate for
their wider roles in the world commerce. Such ports must be expanded and re-developed.

Due to the unavoidable significant function of a port in national economic development, this paper concentrates on “Policy Proposal for Sihanoukville Port Development”.

This study has been undertaken essentially by means of personal research and observation during a two-month vacation, on-the-job training, interviews on field trip, and lectures. This work obviously has some shortcoming due to insufficient statistics and information from previous years.

Nevertheless, there is a great hope that the readers will be aware of the problems related to shipping services, particularly in the Sihanoukville Port, which will inevitably play a crucial role in international trades. The purpose of this paper is to provide information and guideline on how to achieve efficient management of organisational, operational and legislative procedures.

This paper also intent to offer some advice and guidelines on how to organise, administrate, plan, operate and legislate especially to those who are responsible for economic development in general and for the port in particular.

Many ideas exposed herein may be too elementary and most self-evident. However, it should be borne in mind that basic elementary ideas are the most indispensable and often the most neglected.
CHAPTER ONE
COUNTRY BACKGROUND

I. Historical Summary

1- Geographical Location

Kingdom of Cambodia (Cambodia) is a small country covering an area of 181,035 sq. km. It is situated in Southeast Asia, south-west of the Indochina peninsula. The country’s maximum extent is about 580 km bordering with Thailand in the west and north, Laos in the north and Vietnam in the east and south-east. In the south-east, Cambodia is also bordered by the Gulf of Thailand.

In comparison with its neighbours, Cambodia is a geographically compact country administratively divided into 19 provinces, three of which have relatively short maritime boundaries (Figure 1). The country has a coastal line of 440 km and extensive mangrove stands, some of which are relatively undisturbed. The country has wide spread forest resources, some of which have important commercial potential.

2- The climate

The climate throughout Cambodia is dominated by the south-east and north-east monsoons. The south-east monsoons last from mid-May to early October, while the north-east dominate from early November to mid-March. Over most of the country, the average rainfall is between 1,200 mm and 1,875 mm, and there is a pronounced dry season from November to March. In the coastal zone and in the highlands of the south-east and extreme east, the rainfall is considerably high and the
dry season is shorter and poorly pronounced (December to February). The temperature remains high throughout the year. The mean temperature of the coolest month exceeds 19 degrees C.

3- Population

The country's relatively small population is concentrated in the urban and the central rice-growing region, specially south of Tonle Sab and on the Battambang Plain. The population in the coastal zone is sparse, and in the northern and eastern areas, population densities are less than 4 people per sq.km. Ethnically, the people consist of about 90 percent of Khmers, 5 percent each of Chinese and Vietnamese and a small number of hill tribes (Chhams and Burmese). Khmer is the country's official language. It is spoken by more than 95% of the population. French, as a second language, is also spoken, mostly by older people. English is more commonly spoken by the younger generation (FAO, 1993, p.3, 4).

At the end of 1993 the population was estimated to be 9.8 million giving a general average population density of 54 person per sq.km. Currently, the country has an estimated rate of population growth of 2.5 percent per annum. The life expectancy rate of both males and females is 52 years. Infant mortality is high (110 death per 1000 live berths). The literacy rate at 37.8%, is also high (Asiaweek, August 1995, p.58).

Existing rates of population and urbanisation growth are expected to continue over the 1990s, particularly in view of the skewed population distribution (52% of the population are under the age of 18). Moreover, the settlement of about 375,000 Cambodian refugees from the Thai border (Ronas&SIDA, 1995, p.14) will exacerbate rates of increase. Many of the refugees are likely to seek employment in urban areas.
II- General Economic Status

Cambodian statistics are generally regarded as unreliable, but the Gross Domestic Product (GDP) per capita is reported to have been some US$250 in 1993. This very low figure compares with US$130 a quarter of a century ago. Cambodian development has been severely retarded by the civil war and the economical policies during the period from 1975-79, when the money was abolished. Even today, the demand for monetary assets is only 6% of the GDP, as the banking system is still weak (Cambodia, 1994, p.1:6) resulting in a high inflation. Therefore, recently there has been a change in the national currency expecting that it will solve the inflation problems and improve the national economics, but yet, it is doubtful if the target government goal will be achieved.

1- Public Investment

The recent year (1989) has been notable for marked real disinvestment, at least in the public sector. Public investment was 0.4% of the GDP in 1991, representing only 5% of public expenditure. The World Bank has proposed an increase to 3.1% of the GDP (28% of the public expenditure) by 1994. This would require some 85.5 million in project finance from external sources. Further external finance in the form of US$76.5 million in program aid was also proposed in the Bank Report. The combined total of about US$162 million in 1994 should be considered as the absolute minimum needed to keep public services afloat “Additional amounts could be put to extremely good use” (Cambodia, 1994, p.1:6).

Public revenues are very small in relation to the GDP (less than 5%). Short term measures are proposed which could raise this amount to 5.4%. Even so fiscal pressures will not disappear overnight, and donors will need to pay attention to the local cost components of projects. Donors will be called upon to fund these local costs to the extent possible. Further the World Bank Report suggests that a target
contribution for donors to cover 60% of local outlays for investments will be appreciated from 1994.

However, finance alone is not enough and there may be serious bottlenecks in the implementation capacity. It must be an important aim of public policy to speed up the disbursement process. This will ultimately maximise the figures of development aid coming into the country (Cambodia, 1994, p 1:7).

2- Private Investment

Under the storm of a tendency toward a Market Economy several state enterprises were granted management autonomy during 1988. Managers were allowed to retain profit from any production that was surplus to plan targets, and to use them for reinvestment or to pay bonus to their workers.

By July 1991, 25 state factories, generally in deficit, had been leased to private entrepreneurs, and the Government announced its intention to rent all factories that incurred loss to the private sectors.

A law on foreign investment, adopted by the National Assembly in July 1989, allows for 100% foreign-owned enterprises (with guaranties against nationalisation). Joint ventures and contractual business co-operation in partnership with the state also provide a good atmosphere for the foreign investors. However, few contracts have been signed so far. The continuing war as well as the country's lack of skilled managers—all these things have discouraged foreign companies from investments.

It is said that some 250,000 Khmers have settled abroad since 1970, 175,000 in the USA and 40,000 in France, others in Canada and Australia. If their skill and capital could be harnessed, this would be an added boost to private sector
development. Encouraging the private foreign investment is high priority of the Government (Cambodia, 1994, p 1:7).

III- Natural resources, Production and Trade

1- Natural Resources

In general, the soil in Cambodia is rather poor. Some 60% of the country is still under forest cover. There are few valuable wood species, but the undisturbed mixed-deciduous forest ecosystem is among the last of its kind in the world, and contains many species of wild animals, some of them are now extremely rare.

The Tonle Sap Lake is rich in nutrients with 16 varieties of fishes. It was formerly one of the richest inland fisheries in the world, and used to provide fish for export to Hong Kong, Singapore and Thailand. These natural resources have been notably destroyed.

Cambodia has few mineral resources. In the early 1970s, there was small-scale mining of clay (for ceramics), dolomite (for glass making), gold, limestone (for cement), pagodite, phosphate, quartz, sapphire, ruby, silica sand and other precious stones. Most of the activities have now ceased on the commercial scale, except for gold and gemstones (saffire and ruby), mined at Pailin, by the Thai border, operating beyond government control.

Studies in the 1960s suggested that the best commercial prospects were from bauxite at Haut Chhlong (south of Kratie), gold (in Preah Vihear, near Thailand) and limestone in Battambang and Kampot. However, market conditions have changed since then (Cambodia, 1994, p 1:3).
In 1992, a study using Thailand’s geological data estimated that Cambodia had reserved 1,500,000 - 3,500,000 m. Cumft of gas and 50m-100m. barrels of petroleum. In January 1994, a Japanese company (Campex), made Cambodia’s first offshore petroleum discovery (Europa, 1995, p 184).

2- Production and Trade

Agriculture is a breath of the Cambodian economy. In 1992, it accounted for 47% of GDP 63% of which is related to crop production. The agricultural sector expanded by 1.2% in 1990, 1.6% in 1991 and 1.97% in 1992 (Europa, 1995, p.184).

2.1- Rice

Some two-thirds of the crop production is rice. Most rice is cultivated by the rain-wet field method, which is vulnerable in years of poor rainfall.

Rice production has recovered almost to a subsistent level, with 160 kg of milled rice per capita available in 1994. This compares with 212 kg per capita in 1967, when there was some export. The total production now exceeds the 1967 level of 2.5 million tonnes. However, the total area cultivated, is still only 75% of the 1967 level, so some imports are still required (Cambodia, 1994, p.1:4).

Secondary food crops are an important complement to rice offsetting any shortfall in rice production. The principle crops include maize, cassava, sweet potatoes, beans and vegetables (soya beans and mung beans). They are intensively cultivated on the river bank. Industrial crops, such as cotton, tobacco, jute and sugar can, are also produced.

In 1990 the rubber production accounted for 35,750 tonnes, in 1991-34,700 tonnes and 1993-23,000 tonnes. In the 1960s, it had been about 52,000 tonnes. The illegal exports of rubber through Vietnam and Thailand is problem. In January 1994
the Government drafted a plan to develop the rubber industry by encouraging private-sector participation. This process, however, is likely to take many years (Europa, 1995, p.183-184).

For the future, the most potential production for cash crops apart from the rubber should be with soya beans and red maize, for livestock feed. In 1989, the soya bean exports, at 15,000 tonnes, were nearly four times the 1960s levels, but maize exports, at about 10,000 tonnes, were only one-eighth. There is a small export of tobacco. Sesame was an important export crop in the 1960s, but not today. Jute is grown for rice sack factories (Cambodia, 1994, p.1:4).

2.2- Livestock

Most small farming families own livestock, which are used for draught and subsistence. Pig and poultry, in particular, also contribute cash income to the household sector. There is a report that some livestock are exported to Singapore and Thailand. There are about 2.3 millions cattle, 800,00 buffalo, and 1.6 millions pigs in the country (Cambodia, 1994, p.1:5).

2.3- Fisheries

Fish plays an important role of protein of the Cambodian people. About 70,000 tonnes of freshwater fish are caught annually, and nearly 40,000 tonnes of marine fish. The fish farming yields around 7,000 tonnes per year. Perhaps, half the inland capture is consumed for family subsistence and the rest is sold commercially. The Koh Kong province exports some 15,000 tonnes of marine fish every year to Thailand.

2.4- Forestry

Official log production in 1991 was about 300,000 cum. of which 132,000 cum. were officially exported. Unofficially, however, production is thought to be 2-3
times higher. Output from the sawmills is only about 5% of the official log production apart from charcoal production (about 7,000 tonnes in 1990). There is little other processing of woods in the country. Log and sawn timber exports are controlled but there was a clamp-down on illegal exports early in 1994. These illegal activities are widely believed to continue for many years (Cambodia, 1994, p 1:5).

2.5- Industry and Services

By 1992, industry accounts for some 15.6% of the GDP, of this some 54% is manufacturing and 38% construction. Industrial growth declined from 15.6% in 1992 to 10% in 1993. The production of bricks and ceramic tiles, food- and beverage-processing and engineering activities continued to record significant growth. The construction industry, however, declined rapidly following the UN's troop departure in 1993 (Europa, 1995, p.184).

The service sector present some 38% of the GDP, which are related to wholesale and retail trade. Transport and communication account for only 2.5% of the GDP, and government administration, including education and health, for 4% (Cambodia, 1994, p.1:5).

2.6- Foreign Trade

The main exports are timber, rubber; other exports include maize, beans, tobacco, soya bean, fish, hides, tyres and handicraft products. Imports include petrol, oil and lubricants (POL), vehicle spare parts, cement, textiles, cigarettes, household goods and processed foodstuffs.

The partner trade changed dramatically in the 1990s, following the dissolution of the Soviet Union and the Council for Mutual Economic Assistance (CMEA). In 1990, most foreign trade was still with the Soviet Union, but by 1993 this had been
almost entirely replaced by Singapore, Australia and other markets (Cambodia, 1994, p.1:6).

In 1988 the deep water port of Kompong Som was opened to international shipping. This leads to a significant increase in imports and exports with Western countries. Economic and political liberalisation in the Union of Soviet Socialist Republics (USSR) and Eastern Europe led to important changes for Cambodia (Europa, 1995, p.185).
CHAPTER TWO
CAMBODIA'S TRANSPORT AND MARITIME SERVICES

I. Overview on Various Modes of Transport

After decades of wars and neglected maintenance, and in spite of heroic efforts by small groups or dedicated staff with very few resources, the roads, rail and waterway networks have deteriorated to such an extent that large parts of country are effectively isolated. Domestic and international markets can only be accessed at extremely high costs or not at all; supply routes for essential commodities are threatened; basic social services cannot be provided, and bandits roam freely in the isolated areas.

1- Roads

The development of the road network in Cambodia started in 1890. Most of the roads that still exist were completed 50-60 years ago and built for light vehicles. By 1969 the network included about 34,000 km of road. The national roads alone have some 4,100 bridges including about 1,000 in concrete.

The total length of roads including tracks was estimated at about 34,000 km in 1990 as in 1969. However, the share of tracks in this total is not reflected in statistic, but was probably much higher in 1990. An official road list from the Ministry of Public Works and Transport (MPWT) from March 1994 shows that the total road network excluding trails and paths is 7,870 k.m. This includes 4,165 km national
highways and 3,615 km provincial roads. Figure 1 shows the distribution of this network. The distinction between national and provincial roads is administrative not necessarily related to the road functions.

Road condition generally are poor, even on the national highways. The road system has deteriorated largely through neglect, with a little or nor maintenance over the past twenty year of war or the period of 1975-78. In some areas the roadbed has deteriorated or been washed away by the monsoon rains, and traffic is diverted alongside the road. Many sections of all national highways are badly pot-hole, and weakened bridges and support structure often have been patched rather than repaired or replaced.

Nevertheless, currently the national highways are under the repair with the assistance from International Communities.

More thorough rehabilitation of the road network started in 1992-93 with support from United Nations Development Program (UNDP) and Asian Development Bank (ADB) and the like. It is estimated that some 3,000 km of main roads will have been reconstructed and an other 600 km rehabilitated. Even on some recently rehabilitated sections, however, there are already signs of damages caused by overloaded vehicles (Cambodia, 1994, p.3:1-3:2).

Beginning in mid-1988 there has been a dramatic increase in the number of private vehicles in the country. Whereas since 1979 the few private cars were old or rehabilitated vehicles. However, the explosive increase was the period of 1990-93. Statistically, it has been officially reported that in 1993, the total motor vehicles registered was 178,860. This includes 147,614 motorcycles, 26,635 light vehicles (cars, pick-up etc.) and 4,511 heavy trucks (Cambodia, 1994, p.5:1). The significant
number of both new and used vehicles have been imported from Singapore and Thailand.

2- Railways

The Royal Cambodian Railway (CFC) has a total of 649 km of a single-track main line with a gauge of two meters, which carry passenger and freight traffic. There are also some special-purpose siding and small branches for freight or serving ballast quarries. This basic network is illustrated in Figure 1.

The northern or “old” line connects Phnom Penh for 385 km to the Thai border at Poipet through Battambang and Serei Sophon (formerly Sisophon). It was built in two sections 1930 and 1940. However, the last 48 km from Sisophon to the Thai border has not been used since early 1970. The rail distance from Phnom Penh to Bangkok is 655 km.

The southern “New” line takes off at a bifurcation 9.4 km from Phnom Penh Station, and continues for 254 km to the port of Sihanoukville at km 263 from Phnom Penh. This line was built in the period of 1960-69 with an assistance from France, Germany and the People’s Republic of China.

Constructed in 1929 to 1943, the northern line was intended to be part of a through route linking Bangkok with Saigon. Although plans exist, the Cambodian part of the Phnom Penh-Saigon was never started.

During and after the war years, maintenance was neglected because of security problems and as having to concentrate all resources on keeping the lines open after tracks or bridge damage by mine or other attacks. A maximum speed limit of 35–40 km/h was imposed on the system, but many parts are restricted to 20 km/h or less.
CFC has a total of 15 main line diesel locomotives, 10 steam engine and 4 diesel shunting locomotives. It also has 247 wagons in running condition. Nevertheless, some of them require maintenance and other need to be restored (Cambodia, 1994, p.6:1-6.3).

3- Waterway

Waterway plays an important role of Cambodia’s transport system. The major waterway routes are along the Mekong River, and up to the Tonle Sap River into the Tonle Sap (Great Lake), covering about 2,400 km, of which some 321 km are navigable year around with an additional 534 km navigable by motorised vessels during the high water monsoon seasons. Ocean-going up to 2000 dwt can travel up to the Mekong River through Vietnam to both the Phnom Penh Port as well as to Kompong Chham (105 km further up the Mekong), with a maximum draft of 2.5-3.5 m in the dry season (Curtis, Grant, 1990, p.119).

Between Kratie and Stung Treng (120 km) 50 tonnes boats can pass without difficulties in the rainy season, but at low water level, the rocky conditions limit passage to smaller vessels of up to 20 tonnes.

On the Sap River, the draft is 1 m in the dry season but can reach up to 4 m in the rainy season. However, there is a water depth of only 0.5 m at the entrance to the Great Lake in the dry season. The other main waterways of importance for commercial river transport are the Bassac which links Phnom Penh with Chau Doc (Vietnam). This can be used by 100 tonnes boats which can take up to 100 tonnes at high water. However, cargo loading can be limited to 10 tonnes at low water. Furthermore, it has a network of tributaries and canals, mostly in the Takeo province.

Sections of other rivers are often used for navigation, but only for local transport in small boats. In addition it should be mentioned that passage is only
possible by day due to the non-existence of navigational aids and lights on waterways (Cambodia, 1994, p.8:2).

4- Airway

Cambodia has one international airport at Pochentong; this is a reason why this airport is named Pochentong Airport, is about 10 km from Phnom Penh.

Nowadays, there are three airlines in operations. One is Kampuchea Airline, two is Cambodia International Airline and three is Malaysia Airline.

The Kampuchea Airline was started to operate from 1982. This airline flies from Phnom Penh to Moscow (Russia), Ho Chi Minh (Vietnam) and Vientiane (Laos), and flies charter tour to Angkor Wat.

The Cambodia International Airline started to operate in 1992. It is a joint venture between the government and Fuldaa Group of Thailand. It operates routes to Bangkok (Thailand), Hong Kong, Singapore, Vientiane (Laos) and Ho Chi Minh (Vietnam). Malaysia Airline flies between Phnom Penh and Kuala Lumpur (Malaysia).

In 1993, the government signed an agreement with Singapore International Airline to start a new national carrier, Royal Air Cambodge (RAC). RAC was to be the only Cambodian Airline authorised to operate international routes, and was expected to merge with Kampuchea Airline. This airline was commenced by mid 1994 (Europa, 1995, p.192).

II- International Ports

Cambodia has two international ports: Sihanoukville port (formally Kompong Som), and Phnom Penh port. However, the provincial port of Koh Kong also gets
involve in international trade with Singapore and Thailand. This port, yet, is not recognised as a international port according to the Aknoukrit No 13 Or.No.Kror issued on date 11, July, 1986.

1- Sihanoukville Port

This is only a single seaport of Kingdom of Cambodia. It offers port facilities for 10,000-12,000 dwt sea-going vessels and handles a large volume of the country's imports and exports. The entrance channel and pier affords 8.00 m maximum draft and is protected from the high waves of the Gulf of Siam by a string of islands to the west (Curtis, Grant, 1995, p.122).

Until late December 1988, only ships from socialist countries were allowed to use this port.

The characteristics and present conditions of the port, its facilities and equipment including the services as well as the traffic are described in detail in this whole work.

2- Phnom Penh Port

This is a river port. It is situated at the confluence of the Mekong and Tonle Sab/Bassac River (Chaktomuk or Quarter Bras), 300 km from the Mekong estuary. The distance from Singapore is 1,450 km. With a maximum draft of 4 m, the port can accommodate ships up to 2,000 dwt. However, 5,000 dwt vessel can pass entrance to Mekong (the main bottleneck) on favourable tide.

The port has 185 m re-inforced concrete piers (for international ships) as well as 540 m of floating pier (for barge and domestic or inland water craft). It also has 12 warehouses for some 7,032 tonnes of cargo. The port can discharge an average of only 200-250 ton/day (Curtis, Grant, 1990, p.121).
The main general cargo port is in the central part of the city, on a narrow strip of land some 40-50 m wide which inhibits operation. The roads surrounding the port are very poor and need reconstruction. There is no rail connection, but there is a rail link to the Sab River some 6 km upstream from the port, although river/rail transhipment has ceased. The port is in the congested urban area so there are periodic calls for relocation.

3- Koh Kong Port

It is a provincial one and really a system of three ports through one of which vessels enter to Cambodia from Singapore, Malaysia and Thailand. This is Paklong Port which is situated on the Gulf of Siam about 15 km from the Thai border. The port can be accessible for vessels up to 300 tonnes, or 500 tonnes at anchorage. The 300 tonne vessels can proceed across the bay to Koh Kong town for loading or transhipment to smaller ships, if required.

There is no other means of access from Koh Kong to the rest of Cambodia except on waterways. In this case, all vessels must make use of Sihanoukville and Sre Ambel ports (a domestic port) (Cambodia, 1994, p.7.4).

III- Maritime Services

As a coastal state, Kingdom of Cambodia offers a limited varieties of maritime services. First of all, it provides a seaport (Sihanoukville Port and Koh Kong Port) which can facilitate inward and outward of vessel from/to maritime nations. In accompanying with these ports, especially Sihanoukville Port, the services like bunker, water, pilotage, towage, inland transport connection to sea transport, ship repair are also available despite some of them are limited. The detail of these services will be found later on in this work.
Apart from the services mentioned above, Cambodia also provides shipping services. Currently, there are 3 national merchant fleets with a total displacement of 3,558 Gross Registered ton (GRT), the detail of them is given in Table 1 below.

**Table 1 : The National Merchant Fleets of Cambodia**

<table>
<thead>
<tr>
<th>Type of fleet</th>
<th>Number in fleet</th>
<th>Age (year)</th>
<th>Total displacement (GRT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cargo carrying ship</td>
<td>1</td>
<td>71</td>
<td>998</td>
</tr>
<tr>
<td>- Ship of miscellaneous activity</td>
<td>2</td>
<td>23</td>
<td>2,560</td>
</tr>
</tbody>
</table>

Source: Lloyd's Register of Shipping 1993

Last of all, Kingdom of Cambodia has Navigation Company (KAMSAB), Kampuchea Shipping Agency & Broker (with ties to Singaporean Shipping Agency). However, the activities of shipping agency is predominant over the brokerage.

It should be mentioned also that, all the foresaid maritime services are in the hand of MPWT.
CHAPTER THREE
SEAPORT "SIHANOUKVILLE"

I- General Status

1- Location

Sihanoukville Port is situated in the south-east part of Cambodia, on the Gulf of Siam. It is the main deep-sea port and was constructed in 1950 and 1960.

On the land side, the port is linked with Phnom Penh via National Road 4 and the new railway line. The rail distance is 263 km while the road distance is only 226 km.

In terms of waterways, the port is 540 nautical miles from Singapore.

2- Port Facilities

Sihanoukville Port can be accessed via a 3-kilometre fairway channel, marked by buoys and leading lights for navigation during the day only. However, the port is restricted to vessels of less than 8.00 m draught due to rocky outcrops in the channels. The port comprises of 2 wharves: the old and new wharf.

The old one was completed in 1958 and by that time it could berth up to three 10,000 dwt and one 7,000 dwt vessels at a time. This is a double-sided concrete jetty. There are 2 warehouses at the back of the jetty, which is linked to the shore by a 10-metre-wide road and rail bridge.
### Table 2: Existing Sihanoukville Port Facilities

<table>
<thead>
<tr>
<th>Facility</th>
<th>Size/Area/Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Old wharf</td>
<td>Length: 290 m&lt;br&gt;Width: 28.5 m&lt;br&gt;Depth: 8.5 m</td>
</tr>
<tr>
<td>2. New wharf</td>
<td>Length: 360 m&lt;br&gt;Depth: 6.5-7.5 m</td>
</tr>
<tr>
<td>3. Warehouse No.1 and No.2</td>
<td>50 x 120 x 9 m per each</td>
</tr>
<tr>
<td>4. Warehouse No.3, No.4, No.5</td>
<td>50 x 240 x 9 m per each</td>
</tr>
<tr>
<td>5. Container packing area</td>
<td>21,600 sq.m</td>
</tr>
<tr>
<td>6. Open storage area</td>
<td>50,000 sq.m</td>
</tr>
<tr>
<td>7. Bunker</td>
<td>Available in emergency only</td>
</tr>
<tr>
<td>8. Water</td>
<td>Available at the main wharf. Limited quantity can be supply by tug boat at the anchorage areas</td>
</tr>
<tr>
<td>9. Dry dock</td>
<td>Vessel of 300 dwt can be repaired</td>
</tr>
<tr>
<td>10. Oil jetty</td>
<td>Former processing capacity 600,000 tonnes&lt;br&gt;Storage capacity in operation: 60,000 cu.m&lt;br&gt;Depth: 4.5 m&lt;br&gt;No slop disposal facilities</td>
</tr>
</tbody>
</table>

Source: Sihanoukville Port

The new wharf was completed in 1969 and is faced by 3 warehouses. It has a design depth of 10.5 m, but due to the siltation, this has been reduced to 7.5 m.
The new wharf area is sheltered by 2 breakwaters. The northern one is 2,650 m long and the southern is only 550 m. The northern breakwater was never completed so as the entrance has a width of 550 m, 220 m wider than planned.

Both wharves also have a rail connected. A plan of the port is shown in Figure 3. Further, the port has one dry-dock. It is able to repair vessels up to 300 dwt. Nowadays, this dry-dock is used to repair the tug boat and some small domestic vessels.

The warehouses have been under-utilised in recent year due to their poor condition (leaky roof). They have a total capacity of about 36,000 cu.m.

Behind warehouse 3-5 there are a railway platform, tracks and a container parking area. It is estimated that this area can hold perhaps 144 TEU, stacked one high. There is also room for expansion which gives a future possibility of nearly 400 FEU or 600 TEU if stacked three high.

### 3- Equipment

Sihanoukville Port has a certain amount of handling equipment such as mobile cranes, fork lifts, to lifter and means of transport such as trucks, tractors trailers and many other items of equipment; the number of each equipment is shown in Table 3.

Most of these equipment are old and difficult to maintain. Another top-lifting fork-lift truck for handling 40 FEU up to 42 tonnes (and stacking 3 high) has been ordered.

The port workshop is a former tractor assembly plant located over 4 km from the port along a hilly route. It is in poor condition, poorly equipped and quite unusable for the present purpose. Electricity supply is erratic. New and more
accessible maintenance facilities are badly needed, not the least for the expensive new equipment which will be ordered.

Table 3: Existing Sihanoukville Port Equipment

<table>
<thead>
<tr>
<th>Items</th>
<th>Number</th>
<th>Capacity ton per each</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Trucks</td>
<td>8</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>- Tractor head</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>- Tractor trailer</td>
<td>6</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>2- Handling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mobile crane</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>- Elevators</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>- Top-lifter</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Buoys</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>- Pilot, tug boats</td>
<td>3</td>
<td>about 30-45</td>
</tr>
</tbody>
</table>

Source: Sihanoukville Port Statistic 1994

4-Oil Jetty

Sihanoukville's oil terminal for the POL traffic is also a part of Sihanoukville Port. It is located 9 km away from the main port. Initially, this terminal was an oil refinery; it was constructed by French and put in operation in 1969 with a processing
capacity of 600,000 tonnes of crude oil a year. After the prolonged civil war, it was destroyed. Nowadays the jetty has a depth of some 4.5 m and is operated by the Cambodian Fuel Company (CKC) and Shell to import refined oil from Singapore.

The terminal has a good linkage with Phnom Penh through the railway and hinterland. Currently, the terminal has a storage of 60,000 cu.m. capacity in operation and another 80,000-100,000 cu.m. is expected to be possibly repaired. There are no firm plan at present to restore the oil refinery, which is believed to be beyond repair.

II-The existing Port Traffic

At present, Sihanoukville Port has a total throughput of 522,000 tonnes with a vessel turnaround of 403 vessels in 1994. This figure is about half its existing capacity. The breakdown of the traffic in 1993 is illustrated in Appendix 1.

Figure 5 shows that the traffic from 1986 to 1994 has increased considerably except for the period of 1991, the detail of which will be discussed later on in Chapter V. However, the traffic in 1992 and 1993 was not typical years, because at that time there was an influx of UN troops. The annual average growth from 1986 to 1990 is 25.5% (see Table 6).

At Sihanoukville port, some two-thirds of the traffic is import and one-third is export. Cement and construction materials made up nearly three-quarters of the non-fuel import. Most of the export is timber logs and material construction.

Furthermore, Sihanoukville is becoming increasingly important as a container port. Three shipping lines make up regular weekly or fortnightly calls with containers from Singapore. 18,692 containers used the port in 1993 and in 1994 the total was 21,186. The predominant oversea-origine is Singapore.
It is very hard to over-emphasise the paramount importance of Sihanoukville Port, which is the only seaport of the entire country.

First of all, this seaport provides direct access to the world market and an excellent opportunity for developing trade with a wide range of countries, without costly intermediaries. Not least volume of goods supporting industrial and agricultural sectors move through this port as can be seen from Appendix 1. Without this seaport, there is no alternative means to directly move such goods in such tremendous quantity, while the country needs to be urgently rehabilitated and developed.

![Figure 2: Sihanoukville Port Revenue (1994)](image)

Source: Sihanoukville Port statistic 1994

Apart from that, Sihanoukville Port, like other ports in other countries, is an excellent source for employment of workmen and commercial office personnel in numerous activities connected with administration, operation and maintenance, and various auxiliary services to cargo and to vessels; as can be seen from Table 4, 1009 people work for the port authority. In addition to that, an uncountable number of jobs
are found by people living around the port area involving in many different businesses: hairshops, tobacco shops, restaurants, coffee houses and so forth.

At last, but very important, Sihanoukville Port contributes a tremendous income to the national economy. In 1994, the income was US$5.7 millions. Of this income, the major source was stevedoring, and port dues and pilotage, (Sihanoukville Port statistic 1994). The breakdown of this revenue is shown in Figure 2.
Figure 3: General Plan of Sihanoukville Port
CHAPTER FOUR
ORGANISATION AND MANAGEMENT PROBLEMS OF SIHANOUKVILE PORT

I- Administration

1- General Form

Sihanoukville Port is a separate semi-autonomous enterprise under the MPWT. It has a port authority headed by a port director. This form might somehow make a confusion over limitation of power and responsibility of port authority regarding the operation and management. For the time being, the board of commissioner does not exist and therefore the functional and administrative management is performed by the port authority and ministry respectively.

2- Internal Structure

The port authority itself has one director and four vice-directors and is divided into 9 offices as follows:

- Administrative office
- Planning office
- Commercial office
- Office of Finance and Accounting
- Technical and Material office
- Harbour Master's office
- Logistic office
- Handling Operation office
• Warehouse and Stock Management office

Such an administrative structure and its subdivisions are illustrated in Figure 4. From management point of view, this structure is over-bureaucratic, burdensome, non-functional and likely to be insufficient. There is no marketing, research and development, international co-operation and training, environment and safety responsible divisions. All these divisions are, undoubtedly, quite important for port improvement, development with a safe and environmental pleasant.

Within the bounds of operation and management, they are divided between ministry, municipality and port authority. The port authority has freedom to determine only some matters. These are port operation, the character of operation regulations, and defining direct activities of the port, while the reception facilities are provided by municipality and the rest are kept with the MPWT. This, consequently, might somehow make confuse to the port authority from the management and operation viewpoint because the responsibility for overall performance of the port is unclear.

Furthermore, according to information available, communication and co-ordination between the ministry and port authority is still weak and erratic. There is a lack of clear definition of role and responsibility. The port authority is required to set up policies and a yearly budget to be submitted to Ministry for approval. If it is disagreed, the Ministry can then renew such an instruments on its own.

Furthermore, the port is confronted with institutional problems. Main aspects are unclear ownership with respect to port land, financial relation between port and state, unclear responsibilities and duties of port authority.
Figure 4: Organisation Chart of Sihanoukville Port

Ministry of Public Works and Transport

Managing Director

Vice Director
- Permanent

Vice Director
- Administrative
  - Administration Office
    - Administration
    - Delegation
    - Person & Labor
  - Technical and Material Office
    - Oil & Petrol
    - Construction
    - Technic. Team

Vice Director
- Technical
  - Office of Transport
    - Exploitation
    - Technical

Vice Director
- Commercial
  - Stewedoring Office
  - Warehouse & Stock Office
  - Harbour Master Off.

Vessel Form Committee

Commercial Office

Remarks:
--- indirect control
--- direct control
3- Co-ordination on the National Level

There is no doubt that there must be co-ordination of the port development policy since within Cambodia there are several ports being owned by the state. In this context, all these ports, in particular Sihanoukville Port and Phnom Penh Port, have a similar pattern of port tariffs and regulations. Formalities for clearance of ships and cargo are also the same in all these ports.

Nevertheless, these two main ports have broadly the same total price paid by shipping from Singapore to Phnom Penh (including transhipment and the journey on the Sihanoukville route), even though these two roads are relatively different in distance. This is natural as they wish the other to predominate, yet each will charge as much as they can. The price tends to converge somehow.

From national economic and development points of view, this is rather extensive competition and can lead to a break down of co-ordination of the port development policy, which is obviously needed, specially since these ports are under the supervision of same body, the MPWT.

Apart from that, the consultation between the port authority and users of the port in respect of operation and development is still weak and inappropriate.

II- Port Operations

1- Various Systems

Like other ports, Sihanoukville Port renders a great variety of service systems to ships and cargo. These are stevedoring, pilotage, ship berth, cargo handling, towage, handling of cargo on land and repairing. This means the port administration becomes not only a public body but also a commercial enterprise performing functions, which in other field of economic activities, are usually performed by private
firms. However, as far as stevedoring is concerned, this service is rendered by the port authority and the private sector.

In this sense, the private sector is a substitute. When the port can not offer sufficient stevedores for operations then the extra required number is taken from private sector. From a national viewpoint, this is not consistent as the private sector has to be ready to supply stevedores if required. This means a reasonable amount of workers are left while the other sector is short in workmen.

2- Physical Handling of Cargo

In Sihanoukville Port, all mechanical equipment such as mobile cranes, forklift and other 31 items of equipment are supplied by the administration, while handling of cargo with the help of that equipment is sometimes performed by the private sector. The service mixture as such causes a confusion over the responsibility between these two parties, for example if the cargo is lost or damaged, then the question of who should be responsible for that will be arisen. Apart from that the private sector may somehow does not seriously take care of public property.

Nevertheless, on the terminal reserved for the exclusive use of an oil exploration company (Cambodia Singapore Logistic Corporation, CAMSIN Co.), it appears to leave that company full freedom to employ its own labour forces or contractor of its choice.

In addition to the problems of cargo handling management, Sihanoukville Port mainly faces a problem of inadequacy of loading and unloading equipment as can be seen from Table 2. The basis characteristics of this problems are the large scale and fast transport system originating in maritime developed countries, where ship types and loading/loading equipment have grown together. Therefore, the speed of handling
cargo (time speed of one tonne of cargo) in Sihanoukville Port is significantly low compared to other ports (see Table 8).

- Container Handling

Handling containers is a serious problem faced by Sihanoukville Port. The port does not have a container terminal while the container traffic is considerably increased (see Appendix 2).

The loading and unloading of containers is done by the vessel gear directly either to the truck or quay depending on weather conditions and then moved to a container yard by truck or top-lifter. According to the author's observation, the handling speed of containers is 9 TEU/hour per gang which is quite inefficient.

The containers can be handled at both wharves; however, at the old wharf, the operation is comparatively difficult due to its location. Yet it is still favourable in terms of draft.

As far as the container handling equipment is concerned, it is fairly adequate. As can be seen from Table 3, the port has one top-lifter (the other one is under order), with some fork-lifts. Therefore, the handling operation can be done fairly well if the skill of labour is high enough and with the proper container yard management.

3- Mechanisation

Generally, the Sihanoukville Port Authority is facing many problems concerning the uses of mechanisation. Mechanical cargo handling equipment must be purchased from advanced countries for hard currency. Further, spare parts, lubricating oil must be imported in all cases. Finally, works must be suspended waiting for them to come, if they are needed to be used.
Mechanisation is also affecting the personnel and their skills. In this sense, qualified personnel and frequent training are required to cope with equipment. Due to the poor technical background of the personnel, this puts even harder pressure upon the port authority to train its personnel, in particular when the modern equipment is bought in.

4- Movement of Vessels within the Port

In Sihanoukville Port, the essential services connected with the movement of vessels within port waters and immediate approach channel is performed by pilotage and towage. In Sihanoukville Port, these services are directly employed by the port authority and they form a part of harbour master’s personnel.

Pilot functions as advisor. They provide local assistance for navigating through access channels and for manoeuvring within the restricted water. Pilotage use is compulsory and the language used is English.

According to information derived from the harbour master’s office, currently it is composed of pilots with different educational backgrounds. Some of them are French educated with a long experience and others were educated recently in the Soviet Union and Vietnam with no or little experience. The latter are not so familiar with local conditions of depth of water, prevailing winds and currents.

The harbour master’s office is also facing the problems of equipment used. As it can be seen from Table 3, there are only 1 pilot vessel and two tugboats. Each of them is in poor condition and difficult to maintain. Nevertheless, the pilotage operation is fairly good - 1h30-2h00 for the distance of 3-7 miles respectively (3 and 7 mile from anchoring to the general cargo terminal and oil jetty respectively).
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5- Management for the General Cargo Traffic

As far as the general cargo traffic is concerned, its management is made by a shipping agency and port authority (administrative, harbour master and warehouse office).

On receipt of the information through a shipping agency passed by the cargo owner, the following actions are proceeded by the port authority:

- provision of a suitable berth, where enough space for transit is available, on the basis of vessel’s draft and size
- preparation of plan for operation
- arrangement of equipment and labourers for operation

Nonetheless, the stowage plan is seldom applied, since most of the cargo is directly transported by the owner to the final destination while a small amount of requires warehouse. This consequently causes a problem of cargo movement in the port area on the one hand and damage to quay apron on the other.

Additionally, the port faces many difficulties in arranging and planning equipment and labourers due to the excessive number of small packages with different dimensions and configuration (sacks/bags, drum, boxes”short, long, big and small).

Furthermore, since the quay apron is not wide enough, sorting these packages cannot be done on it, nevertheless, the customers to a certain amount want to do so, therefore the movement of sorted goods direct to final place of stacking is slow down

6- Clearance and Delivery Formalities

In Sihanoukville Port, clearance is the main source of administrative delay. The main reasons are as follow:

- The working time and day of the customs and relevant authorities are limited and no extra working time
- the over-bureaucratic procedure (too many unnecessary formalities on many different desks)

The following statement is quoted from the Panama's captain "...we have, sometimes, difficulties with clearance. When the ship arrived, there is no clearance committee coming, therefore, we get to wait.... In such a case, our seamen cannot go ashore unless it comes.....".

Nonetheless, the waiting time for clearance is different from one cargo owner to another depending upon the relation between these to parties and the attitude of cargo owners in particular.

III- Port Finance and Dues

1- Financial Policy

As it has been stated early, financial policy is done by the port authority and approved by the MPWT and ultimately inserted into national policy. However, the government does not reserve any assistance to the port. In this regard, the revenue generated is remained with port authority. These revenue is used for two purposes:

- Operational expenses
- Fund reserving for unforeseen contingency plan, port requirement, modification, oversight extensions and regular renewal and modernisation of port installation.

These expenses and fund, nevertheless, must be approved by the MPWT.

As far as this fund is concerned, it can be obtained from a services and long term loan (ADB). The port has its own budget, which can be subdivided into 2 main parts:

+ Ordinary (for current revenue and expenses)
Extraordinary budget (non-recurrent expenses on major port extension works).

The ordinary budget varies from day to day due to the flexibility number of workers (stevedoring) resulting from the work required.

According to information available, these sound finances do not enable the port administration to keep all the facilities on a high technical and operating level and to render efficient and economical services to port user. Apparently, currently port traffic requires some improvements such as dredging, reconstructing warehouses, creating a new container quay, repairing apron and so forth. But due to the chronical deficit and the resulting lack of funds some of these requirements are gradually fulfilled or not at all and consequently the quality of services is deteriorated.

2- Port Dues and Tariffs

Port dues are the main source of income of Sihanoukville Port. They include dues on vessels and cargo. According to the author’s analysis, the level of dues is not in proportion to the value and usefulness of available facilities to various categories of traffic (maintenance, amortisation of work such as breakwater, access channels, turning basins, light and aid to navigation and partly deep water quays). This is quoted from interviewing with one of the shipper “Port dues in Sihanoukville Port are not high compared to other port within a region; nevertheless, we are not satisfied because they are not proportionated to the services rendered...”.

The scale of tariff of port dues is not calculated based on the factor mentioned above, in contrast it is just duplicated from Vietnam and Singapore and other. The tariff is rated in dollar per gross registered ton for both port due and dues on auxiliary services as shown in Appendix 4.
Regarding the dues on auxiliary services, such dues are not based also on the factor mentioned above; therefore, it is not known if these dues are fixed on a level sufficient for current cost of services.

As far as the dues on the uses of warehouses are concerned, the port has set up a policy which allows the cargo owner to store their cargo without charge within 7 days. This philosophy is rather good from the port marketing viewpoint. Yet, it seems not to be a good solution due to the poor maintenance and condition of the warehouses (leak roof).

IV- Personnel and Labourers

1- Personnel

The Khmer Rouge exerted a heavy toll among the country’s academic, as is not the least apparent at Sihanoukville Port. Many others have left the country, and the employment conditions offered makes it difficult for the port authority to compete with the emerging private sector for the remaining qualified personnel.

The drain of resources has caused a generation gap between the two main categories of staff. On the one hand there is a very small number of qualified staff in senior positions, with 15-30 years of experience but no or little experience to the port and usually from a Frankophone background. On the other hand there is a young generation of relatively recent graduates, with little or no relevant experience but with a formal, although often inadequate, education from either the local university or from former Eastern bloc countries.

Competent intermediate level staff should normally be the backbone of the port but is now largely lacking. This means that the few competent senior staff have to spend much time on daily routine work on ordinary job, leaving less time for
planning and policies. Further, the intermediate staff - now lacking - would normally also be responsible for the on-the-job training of new staff, which is thus also lacking.

Due to the unavailability of selection of books and publications on ports and shipping matters on economic development to ports, port personnel cannot be kept currently informed on various developments in the field of cargo handling techniques, new methods in sea transport, trends in maritime trade and similar matters of general interest to port. This, hence, has caused a wide variety of difficulties to port planning as a whole.

2- Labourers

The problem with labourers in Sihanoukville port seems to be less difficult to solve than the problem of personnel.

Table 4: Statistic of Present Personnel and Labourers of Sihanoukville Port

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Administrative</td>
<td>96</td>
<td>11</td>
</tr>
<tr>
<td>Technical</td>
<td>114</td>
<td>0</td>
</tr>
<tr>
<td>Operational</td>
<td>748</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>958</td>
<td>51</td>
</tr>
</tbody>
</table>

Source: Sihanoukville Port Authority

Labourers are not only abundant but also resistant to fatigue, fairly skilful and ready to undertake most existing tasks.

Nevertheless, experience in cargo handling, particularly in modern techniques, is lacking as well as a sense of responsibility for the safety of cargo and fellow workmen.
Moreover, English is also a concern for port operations as far as the language is concerned. All cargo and its instruction is written in English, especially dangerous cargo. Such cargo needs to be handled and stored in the proper way. If the port’s personnel and labourers are not capable of understanding written English, they have to wait for orders. This, therefore, can cause interruption of working routines and resulting delays.

V- Problems of Facilities and Equipment

1- Facilities

As indicated earlier, Sihanoukville Port has two wharves. They have different age. However the older one is more used than the new one due to its deeper draft, though it is in poorer condition and less favourable, especially during the heavy weather condition. In addition to that the older wharf has a small apron, thus it causes sometimes interruption to the cargo flow from quay. At last, but not least, the consignees very often bring their trucks to pick up cargo directly from quay. All this matters make a terrible concern for the port authority from the safety point of view.

Apart from that the two wharves were originally constructed for loading general cargo vessels, but nowadays they are necessarily used for handling bulk, container cargo as well as vehicles. This makes a very difficult problems for port in the sense of operation.

As far as the warehouses are concerned, they are in poor condition as stated early. Their roof is leaky, their pavement is not well prepared, the conditions and management are not appropriate for storing different types of cargo, the emergency response equipment is not appropriately equipped. All this factors might somehow discourage the consignees in making use of these facilities.
In respect of the container yard, it presents fewer problems than other facilities, that is the axle load which prohibits fork-lifts for handling containers in the yard. However, this problem will be overcome, especially when the Special Rehabilitation Assistance Project (SRAP financed by ADB) resurfacing is completed.

Furthermore, the port is facing a problem of bunker and water supply due to its present condition. Therefore, the bunker is available only in emergencies, while the water can be provided in a limited quantity. This might be one of the inefficiencies of port's economic.

2- Equipment

Apart from facilities, Sihanoukville Port is also facing the problems of equipment being used. Most of the equipment is in poor condition and difficult to maintain. The pieces of equipment have been procured over a number of years; they differ by type, age, state of repair and efficiency. Hence, they require repair and maintenance very often, while the stocks of spare parts are inadequate. These subsequently cause the problems of high repairing and maintaining costs and very often it takes time to wait for spare parts. The last case results in a certain proportion of equipment being out of service.

V- Other Problems

In addition to the constraints of technical work, Sihanoukville Port is also facing the problem of offering to its users various auxiliary services and installations.

1- Aid to Navigation

In Sihanoukville Port, there is no existence of auxiliary services except buoys, the total of which is shown in Table 3. Such buoys are placed along the entrance
channel to the port to lead light for daylight navigation. These buoys are installed with certain distance from each other depending upon the sea-bottom configuration.

Due to the non-existence of other aids to navigation, especially lighthouse and navigation light, the port is being accessed only at the day time. This, therefore, causes great difficulties for ships that arrive in the port area at night or in bad weather conditions.

Moreover, the ship’s master as well as the pilot might somehow face problems with the placing distance of buoys because they are far beyond the visibility, in particular when there is fog, morning haze, heavy rain and the like. Hence all these factors can cause collision danger to vessels which enter or leave the port during that time.

2- Ship-to-Shore Radio

The problem with ship-to-shore radio seems to be somehow less compared with aid to navigation. All this equipment is appropriately installed and placed in the Harbour Master’s office and operated by its own personnel. However, as far as the radio wave length is concerned, this equipment is not desirable. It has a several mile range and therefore it is difficult for the harbour master to contact vessels well in advance of their actual appearance at port entrance.

3- Meteorological Services

Due to the unrecognition of significance of these services on the one hand and over-confidence with the local weather conditions on the other, Sihanoukville Port does not have any form of meteorological services. Hence, this creates problems for the master manoeuvring a vessel, in particular when navigating vessels near reefs or shallow waters in close vicinity of the port entrance.
4- Relation with other Ports

4-1- Regional Co-operation

Inevitably, all ports within Cambodia, especially Sihanoukville and Phnom Penh ports, which are under the same Ministry (MPWT), must be co-operated on the national basis. Such ports exchange experience gained in design of facilities, material uses, methods of construction under similar natural conditions and so forth. Organisation of operations, methods of cargo handling and the uses of mechanical equipment is also a field for common studies and for comparison of results obtained in each port.

Such exchanges, studies and comparisons are obtained through the arrangement of periodical consultation between the management of such ports mutually or during a ministry’s meeting and conference.

Nevertheless, this co-operation is not yet desirable due to the over-competition on the one hand and the lack of know-how and skilled personnel in this field on the other.

4-2- International Co-operation

The co-operation on the international basis of Sihanoukville Port with other ports is weak and vague. This might be due to the negligence in this matter of the government, especially in respect to port development and technical aspects.

However, the port authority has been provided some field trips and short-term training as well as visits to other ports outside Cambodia in the form of assisting programs, while some consulting and short-term training in the country have been offered by assisting countries. The major partners in this program are Singapore, Belgium, Vietnam, Thailand, France and others.
1- Legal Process

As it has been stated earlier, Sihanoukville Port is under supervision of the MPWT in respect to administration, while the port authority itself performs a functional management.

As far as the administrative management is concerned, the MPWT is in charge of making long-term port planning, approving yearly financial statement, adopting some laws, and nominating the executive bodies (vice-director, office manager) except director that must be approved by government.

Regarding to legislative procedures, some legislative instruments, such as system of administration, scheme of organisation of executive department, and system of port tariffs and dues are drafted and adopted by port authority and ministry respectively, while other regulations concerning to operations are exclusively leased to port authority. Such procedures are rather complicated, non-functional and difficult to implement, especially port tariffs and dues form the management and operation point of view. This regulation is usually amended almost every single year if they expect to cope with the competitive market situation. If such a thing is drafted and adopted by the above-mentioned bodies, then it will take longer time to implement. Hence it can cause interruption and delay to the implementation.

2- Legislative Instruments

Due to the poor experience and education of personnel as well as the executive body of Sihanoukville Port regarding legislative instruments on the one hand, and shortage of documents and materials of such instruments on the other, the port has only a few regulations and decrees. These are:
• Announcement on port dues and stevedoring charge tariffs
• Regulation on movement of foreign vessels within the international commercial port in Cambodia
• Regulation concerning aid to navigation
• Regulation on system of port operation
• Regulation on relation and co-operation with other state’s ports

These instruments are likely inconsistencies from the operation and management viewpoint. Some of them are remained from the previous regimes while other are duplicated from foreign countries like Singapore and Vietnam rather than based on local condition. This, therefore causes a problem for port authority in the sense of implementation

VII. Environment Management

Environment issue is a new innovation in Cambodia. This issues are emerged with the creation of Ministry of Environment. This means that environment protection is a newer attention paid by the government as a whole.

Therefore, it might be somehow hard to find these issues penetrate into development of any commercial areas.

As other commercial aspects, environmental management in Sihanoukville Port is almost neglected and redundant.

Practically, port activities composed of many cores of pollution sources, whose impacts can cause a problems varying from minor to major and can be described as follow:
• impacts from location of port
• impacts from construction
• impacts from ship traffic and discharge
• impacts from cargo operation

The two later are subject to this study, however, due to the fact that they are related to day-to-day works of the port and their frequent occurrences.

Undoubtedly, due to insufficient provision of reception facilities from municipality including there is no regulation related to this matters, some ships must have discharged ballast water, sewage, garbage and other residues in ship which are the sources of water pollution. Further, spoil of oil, lubricants, fuel and other oily liquids, which are also other sources of water pollution, are to be found in the port area. Once an oil or oily components are discharged into the water, they are spread on the surface by wind and current forming a thin layer and then be polymerised gradually by biodigitation and eventually form dense particles which sink. Consequently, they will contaminated the bottom quality.

As far as the socio-cultural impact is concerned, oily wastes from ships may reach nearby beaches and spoil recreational activities. Ship traffic may disturb pleasure boat cruising and fisheries boat operation. The possibilities of ship accident become a worry to local people.

Regarding cargo operation, run-off from raw material storage, spills from bulk cargo handling and wind-blown dust are possible sources of contamination of the port’s water and of great concern to the port authority. Toxic or harmful materials are included in the cargoes handled. All of these things can have an impact on the water quality of the port, result in bottom contamination, deteriorating of the marine and coastal ecology as well as diminishing the air and visual quality in the port area.
CHAPTER FIVE
ASSESSMENT OF SIHANOUKVILLE PORT

I- Analysis of Cargo Traffic

Appendix 2 and Figure 5 show the general evolution of the cargo traffic of Sihanoukville Port during 1979 and 1994. From this Appendix and Figure, one can see that in general the traffic increased to a certain extent despite the decrease in a certain year (example 1991).

From 1979 to 1987, the cargo traffic of Sihanoukville Port was relatively stable (on average 130 thousand tonnes) except in 1980 and 1981 (291,000 tonnes and 190,700 tonnes respectively). This was because of the regular flow of aid from the USSR and Eastern European countries on the one hand and the exclusive uses of the port by these countries on the other.

Since 1988, the cargo loaded and unloaded in this port has constantly increased. There were many reasons involved. One was the opening of Sihanoukville Port to international shipping. Second was the increase in export encouraged by the government expecting to balance the trade with western countries. The latter case kept the traffic of the port remaining the same in spite of the drastic reduction in aid from the USSR and Eastern European countries from that year.

Nonetheless in 1991, the traffic of this port decreased considerably (twice compared one year before). This was because of the end of assistance from the USSR.
On top of that, Cambodia was obliged to purchase import (previously acquired through better arrangement or at concessionary rates from the USSR) in convertible currencies at international prices.

Source: Sihanoukville Port statistics 1994

Since 1992, however, the traffic has jumped back to the normal level due to the international embargo on aid and lifted trade, the intensive activities of construction resulted form the influx of UN peace-keeping forces and aid workers, and the arrival of foreign business executives.

As far as the Petrol, Oil and Lubricants (POL) traffic is concerned, Sihanoukville Oil jetty handled less than Phnom Penh Port in comparison although the main oil company (Shell and CKC) prefer to use this port to a great extent.

In 1992, it accounted for 5,112 tonnes while the Phnom Penh handled 264,037 tonnes. This figure jumped up to 23,000 tonnes while Phnom Penh Port handled 307,300 tonnes in 1993, which means that it has increased higher in percentages than
that of Phnom Penh. Nevertheless the port estimated that, in 1994 this figure might
decrease to 8,600 tonnes while the Phnom Penh would be 300,000 tonnes.

The reasons for having lower traffic of POL in Sihanoukville Port than in
Phnom Penh are the insecurity problem of Sihanoukville oil jetty due to its location
especially during the transport from jetty to final customers; second - it is far away
from the final customers.

Even though, Sihanoukville does not have a specialised container terminal, the
concept of containerisation seems to be more attractive from the port user's side as it
is apparently shown in Appendix 2. This Appendix shows that the container traffic has
considerably increased in the last two years.

In 1993 the total container moved across the Sihanoukville Port was 18,692
TEU and in 1994 it jumped up to 21,186 TEU, which means it increases by 13% by
comparison. On top of that, according to the statistical data from the port, the total
container traffic come across is 14,982 TEU including import container 3,873 TEU,
export-900 TEU, and empty-6,209 TEU for only five months of this year. By the end
of the year, therefore, the total figure will reach about 27,000 TEU, according to the
author's estimation. A study in 1994 on Cambodia Transport Rehabilitation made by

Table 5: Growth Rate of Cargo Traffic of Sihanoukville Port (1986-94)

<table>
<thead>
<tr>
<th>Period</th>
<th>Cargo (%)</th>
<th>POL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-94</td>
<td>13.6</td>
<td>11.7</td>
</tr>
<tr>
<td>1987-94</td>
<td>13.2</td>
<td>13.9</td>
</tr>
<tr>
<td>1988-94</td>
<td>12.2</td>
<td>14.7</td>
</tr>
<tr>
<td>1989-94</td>
<td>11.0</td>
<td>16.7</td>
</tr>
<tr>
<td>1990-94</td>
<td>9.0</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Source: SweRoad 1994
SweRoad in association with Lan Xang International and Mari Term shows that the total annual traffic growth rate (1986-94) is around 25.5%. The breakdown of this rate is shown in Table 5.

Forecast
Forecasting is very difficult work and dangerous since the country is in a completely new situation. However, based on the following factors, Sihanoukville Port can be assumed to have a great potential for traffic for general cargo in container or/and conventional vessel, as well as POL:

- The proposed dry port upon which the government has just signed agreement with private company (Singapore company). This will speed up the container movement from Sihanoukville Port to Phnom Penh and consequently decrease the consignee's expenses because the clearance can then be done one day after the arrival of containers at this dry port. As a result Sihanoukville Port is more attractive from the user's stand point.

- The less risk of serious ecological damage compared to Phnom Penh Port by its location because the Phnom Penh Port is situated right at the mouth of the Sap River, which is a main source of fisheries, agricultural production and water for consumption.

- The Cambodian government is considering an environmental legislation in order to prevent the Sap river from pollution. While this legislation is accepted and implemented, Phnom Penh Port has to be moved a bit further from river bend to prevent any possible discharge (dust, cargo spillage, soil leakage etc.) to the river. However, this is not practicable because the existing port is closely tied to the road and buildings in the surrounding area.
• The proposal made by King Norodom Sihanouk to place the Sap Lake as a common heritage of human kind. If this proposal is accepted by the government, the Phnom Penh port needs to be relocated. This requires an intensive capital investment and thus it may lead to use Sihanoukville Port as an alternative by enhancing the connecting transport networks (road and railway expansion).

• The difficulties in negotiation with Vietnam, which is a strong competitive partner in the region, in bridge construction over the Mekong River. If the negotiation is not successfully reached, bigger ships then cannot access.

• The completion of repairing Road No.4 by 1996 which facilitates the transport from Sihanoukville to Phnom Penh. The cargo can then be transported to Phnom Penh within 6-8 hours by this highway.

• The plan to develop the Sihanoukville City to be a free zone, industrial centre, tourism zone, and construction of airport in Ream. If these development plans are put in real practice, the Sihanoukville Port can become a distribution centre and be attractive for to the south-east oriented major traders. Apart from that, Cambodia’s ports might be able to share a certain amount of cargo traffic to/from Laos with Vietnam. This will result in using, needless to say, Sihanoukville Port by a feeders to/from Singapore and others to this particular country. At last, but not least, a being a free zone, a large volume of unofficial border trade, particularly with Vietnam and Thailand, will move by sea to the free zone. On top of that, regarding the urgent need for the country to develop with the open market economy including the population growth rate (2.4%), the country needs to be more involved in an international trade. This will lead to increasing the import and export of goods.
Considering the facts mentioned above the author has come up with the following perspective growth rate of cargo traffic of Sihanoukville Port from 1996-2015 as follow:

Table 6: Perspective Growth Rate of Cargo Traffic of Sihanoukville Port
(1996-2015)

<table>
<thead>
<tr>
<th>Period</th>
<th>General(%)</th>
<th>POL (%)</th>
<th>Container (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-2000</td>
<td>9.0</td>
<td>11.5</td>
<td>11</td>
</tr>
<tr>
<td>2001-2005</td>
<td>11.0</td>
<td>13.5</td>
<td>15</td>
</tr>
<tr>
<td>2006-2010</td>
<td>9.5</td>
<td>16.0</td>
<td>14</td>
</tr>
<tr>
<td>2011-2015</td>
<td>8.0</td>
<td>13.0</td>
<td>12.5</td>
</tr>
</tbody>
</table>

This forecast is quite optimistic and ambitious. However, in this forecast the author assumes that from 1996 forward, in Cambodia, the political situation is stable and the security is maintained. Apart from that, the environment problem is strictly considered by the government, while the port has very good marketing tool in Laos and other countries.

II-Analysis of the Administration

As a developing country, Cambodia inherited from the colonial power a very reasonable form of port administration in the past but not now. However, it still survived till now, with quite insignificant changes. Therefore, there is a need to adopt a port administration to the changed political situation and to the new situation of sharply increased and modified traffic.

It is not easy to select the most appropriate form of administration. On the one hand, a few members of the government are familiar with port matters, on the other, sufficiently experienced personnel are not available.
Furthermore, a radical change of the entire system may be more difficult to carry out because of the long established habits and vested interests. Officers and executives who have for a long time exercised control over some port activities are always reluctant to relinquish their responsibilities in the event of an extensive reorganisation.

Nonetheless, as a young country emerging from the war, Cambodia is free to make a fresh to start and to devise a reasonable and modern status for its ports that will give the best results and be the most appropriate for the country's interests.

Regarding the internal structure, Sihanoukville Port consists of only a single body, an executive, as earlier emphasised. Therefore, the port authority has limited duties and responsibilities.

In this case, the MPWT acts as a policy making body. Every matter related either to port operation or management must be approved by the ministry. This makes the operation and management slowing down because there are a lot of things beyond port matters which are also needed to be taken care of by the ministry.

With respect to organisation of executive offices, it is unclear and complex. Furthermore, it is not based upon the principle of delegation of the port authority. The number of offices is very large and leads to undue dissipation of responsibilities. It appears also that the managing director cannot obtain full important information about current matters through a close daily contact and therefore is obliged to discuss daily problems with several heads of an exclusively diversified office structure. Furthermore, the too many offices might somehow create duplication and confusion of responsibilities among themselves, especially data collection and administrative procedures, for instance the Administrative and Financial offices, Technical and Material, and Planning offices, Cargo Handling and Warehousing and Storage.
Regarding the co-ordination at a national level, its requirement is misinterpreted. For example, duplication of some similarities without compelling geographical reasons, excessive competition among Phnom Penh Port and Sihanoukville Port. Externally, there is a lack of co-ordination between port authority and customs as well as the police. This is quoted from one of the senior executives of Sihanoukville Port Authority “...Between the port authority and customs, it seems to be hard to understand each other. Every one has own regulation and bureaucratic procedure. As a business body, we do not care about administration hours, while the custom does....”

III- Analysis of Port Operations

As mentioned before, all the various systems of port operations are in the hands of the port authority except the reception facilities. Among them, however, only two subjects are to be discussed here because they are of particular importance for the efficiency of port operations. These are management of port terminals and physical handling of cargo and its productivity.

1- Management of Port Terminals

As Sihanoukville Port has only two terminals, these terminals must be used as intensively as possible. There are no big domestic lines which would require a large operation basis. Further, it seldom happens that a foreign line makes as frequent calls as to justify a request for an exclusive berth. Under such conditions, the exclusive reservation of the part of one terminal to a private sector (CAMSIN Co.) might be one of the basic points of decreasing efficiency and economy of port operations, requiring each terminal be used to its full capacity, with minimum interruption and idle days.
Above all, various conditions, such as depth of water and the length of quay are not suitable for the draft and the size of vessels. Mechanical equipment is not sufficient for unloading heavy loads. Space in the transit sheds for receiving inward and outward cargo is in poor condition and thus not available.

Consequently, the waiting time of vessels is a highly undesirable occurrence in Sihanoukville Port even at low peak traffic.

2- Physical Handling of Cargo

Cargo handling is performed by the port authority as mentioned earlier. This system gives the advantage of a more centralised control over the various phases of port operations. It may also allow for easier co-ordination of ship berthing with the start of loading and unloading. Nonetheless, a monopoly on handling cargo by the port has the shortcomings of eliminating the elements of competition. Moreover, the port administration may be inclined to raise its revenues by imposing relatively high rates, while at the same time its duty is to keep all port costs at reasonably low levels.

Another disadvantage of the port authority acting as cargo handling agency is its very character of a public administrative body (IAPH, 1972, p.186-187):

“Even the best organised autonomous port authority has not got the same degree of freedom from certain rules and regulations as an independent cargo handling contractor.”

Private firms have a wide range of freedom in selecting personnel, in providing the most able employees, in dismissing unsuitable and unreliable help, or in negotiating special arrangements with clients who are unable to pay the full regular rates. The old fashioned profit incentive and the natural eagerness to avoid loss have stronger impact on an individual contractor than on public trust. As a result, private contractors are under the pressure to organise their work in a really efficient and
economically way. In contrast, port administration is not sufficiently divorced from bureaucratic methods of management to be in positions of success fully engaged in activities of commercial nations.

3- Productivity

To have a clearer view of the performance of Sihanoukville port operations, it is necessary to define some elements of operation such as operation delay and gang output/man output. It should also be stressed that the following data was collected during the vacation (December- January 1994-95).

+ Operation Delay

Ship’s time at berth consists of the time for handling/discharging cargo and other times which include operational delay. This time can be reduced, depending upon the handling operators.

In Sihanoukville Port, it has been found that the operation delay, which is the time between the berthing and beginning of cargo handling, varied from 15-30 min to 2-3 days. This is dependent principally upon customs hours, relation between consignee and customs, formalities committee (police, customs, guarantene) and the consignee behaviours themselves.

+ Gang Output - Man Output

By definition, the gang output - man output is the average tonnes of cargo handled by one gang - one man in one hour.

From Table 7, in Sihanoukville Port, the gang output for steel in bunch is 3.4 and the man output is 0.34 per man per hour; the gang output for cement or fertiliser in pallet is 22.5 and the man output is 1.25. This is quite low and insufficient.
Nonetheless, it should be borne in mind that these two elements are not directly related, because the man output per gang is different from gang to gang regarding the number of workmen. Consequently it must be confusing if one compares the port operation performance by solely referring to the gang output. Furthermore, other factors must be taken in account (the number of workmen per gang, type and amount of equipment involved in operation).

IV- Analysis of Personnel and Labourers

Shortage of qualified candidates for various administrative and operating posts is the main difficulty which Sihanoukville Port has to overcome.

Opportunities for employment in port are less attractive than work in foreign services or private sectors. Working hours are irregular and longer, the environment less pleasant and noisy, haste and tension more pressing. The port is located far from the capital city with a limited number of recreational and cultural facilities.

Nonetheless, the government still spares efforts in recruiting suitable candidates, providing adequate training opportunities and offering reasonable conditions for employment. Incentives do not compensate for the above mentioned hardship.

As far as the port authority is concerned, its administration does not have its own statute for personnel, possibility of rapid promotion of capable officials.

Very few candidates for positions of responsibility are selected among people with economic and technical background and less familiar with transportation problems and general economy of the country. Personnel initiative, energy and ability to deal with people are scarcely taken into account.
Training port officials is insufficient and irregular, and does not cover a complete chain of ports matters. A few months of actual work in all the departments of the port is not given to the new personnel before they are given a job. Regular courses on academic levels on various port problems to form port personnel are never applied. Team work to discuss various problems of the port does not exist.

Port personnel are not quite well informed about the general policy of operating the port, main goals of the port activities and particular requirements and interests of all port users.

Apart from that, they are not kept currently informed on various developments in the field of cargo handling techniques, new methods of sea transport, trends in maritime trade and similar matters. A library of books and publications on ports and shipping and on economic development has not been sough.

Each employee does not have much feeling that he is performing a useful and an essential task; that he is trusted; and his work is duly appreciated. He does not have a certain margin of independence to increase his sense and responsibility and encourage the use of sound and careful judgement.

As far as the labourers are concerned, they are insufficient and difficult to be trained, especially sending them to schools in developed country, principally because of the language barriers. Illiteracy is commonly found in respect to English, therefore, they are not able to read signs and inscription on various package which they handle.

Sports and other forms of recreation scarcely exist. Discipline and careful working habits are still low due to the non-existence of a labour union and regulations.
V- Financial Analysis

To obtain a clear picture of Sihanoukville Port’s financial matters, it is necessary to divide this part into two aspects: one relates to management while the other concerns the performance.

1- Financial Management

Sound financial management in Sihanoukville Port is somehow weak and erratic. Financial self-sufficiency is not achieved in spite of the fact that it is recognised as a semi-autonomous port. The port can not achieve and maintain a balance of revenues and expenses with due provision for renewal and amortisation of facilities and equipment.

The budgets and a separation of expenses and revenues that do not belong together are not clarified. The expenses are not subdivided into a sufficient number of items such as administrative, financial, consumable, purchase of material and so forth, prerequisiting for a correct analysis of cost. The entire system of accounting is not arranged in a way that makes easier to determine the real cost of various activities.

The port does not separate the expense figures by each particular item, while port budget is included in the general budget of state. Overstepping the limits of budgetary appropriation is common. Therefore, it requires approval from the government and in most cases from the parliament as a whole.

2- Financial Performance

To show a clearer view of the performance of Sihanoukville Port regarding financial aspects, this section will emphasise certain elements of its budget and balance sheet. Details like gross income per tonne, expenditure per tonne and personnel ratio
will be calculated and analysed; however, some elements, such as financial expenditure ratio, are not covered here due to insufficient data.

2.1-The Personnel Ratio

This parameter indicates the percentage of personnel expenditure in the total sale. The personnel expenditure consists mainly wages, retirement, social security, subsidies and so forth. In Sihanoukville Port, the sales consist of port and cargo dues, stevedoring, warehouse and storage, pilotage, transport etc.

In 1994, this ratio was approximately 1.45 % (considering the exchange rate of 2,500 Riels per US$1), which means that for US$100 of port revenues, the personnel expenditure was US$1.45. This ratio basically depends upon many factors such as, number of personnel and labourers and the level of wages. It is also a tool for understanding motivation aspect within the organisation better.

2.2- The Expenditure Per Tonne

The total expenditure of Sihanoukville Port consists of personnel and labourers expenditure, purchase of spare parts, taxes and so forth.

The total expenditure represented, in 1994, US$2,346,590 for 525,074 tons of cargo handled. Thus, the expenditure ratio per tonne was 4.47.

2.3- The Gross Income Per Tonne

This figure obtained by dividing the gross earning of the port by the total tonnage of cargo handled during a year. In 1994, the port had a gross earning of US$ 5,782,360 for 525,074 tons of cargo handled. Hence, the gross income per ton was 11.00.
VI- Analysis of Legislation and Legislative Instruments

As has been stated earlier, the legislative procedures for certain legislative instruments especially regulations concerning port tariffs and dues and others require two basic steps. One is drafting, which is done by the port authority, and the other is adopting, which is done by MPWT and is finally implemented by the port authority. The reason for needing to be proceeded in such a way is the absence of a board of governors who are supposed to be acting as representatives of the government and an independent body regarding the operation and management of the port. Furthermore, the managing director is not exclusively given the right to decide a certain regulation mentioned above.

Regarding the legislative instruments, Sihanoukville Port is quite poor as emphasised earlier. There are many reasons involved the author might analyse. One is the poor knowledge of personnel in this matter. Two is the shortage of materials concerning these matters and the last one, but not least, is, from the author's point of view, the time consuming for adopting these instruments by the MPWT. The last case might discourage the port authority to amend any necessary regulations such as the system of port tariffs and dues.

VII- Analysis of Environmental Management

Having seen the previous chapter regarding the environmental management in Sihanoukville Port, one can easily understand that there are two fundamental constraints facing the port authority. One is a ownership of reception facilities and two is non-existence of regulations regarding this matter. Furthermore, the problem of unawareness of personnel in this regard should not be ignored.
Reception facilities, which are insufficient, poor and difficult to be maintained, are owned by the municipality who is not really involved in port business. Such a ownership might not be properly worked due to unfamiliarity of the municipality with port activities. On the contrary, the port authority who is always involved in day-to-day job and is the one, who suffers when pollution takes place, has no authorisation to handle this job.

As far as cargo operations are concerned, the port personnel and labourers have no idea on how to handle hazardous cargo, especially dangerous cargo listed in the IMDG Code, while the training on that particular subject is never done. In addition, the port authority has not established any contingency plan and has no pollution prevention equipment to respond to any possible emergency and pollution occurred.

From the safety side, the system of assistance for arriving vessels is not sufficient. There are only one pilot boat and two tug boats; all of them are difficult to be maintained, and there is no navigation system, vessel traffic service, separation and routing scheme.

As an organisation concerned more than others about environmental protection within port water, the port authority has no single person who is substantially aware of the environment. Hence, the awareness of this matter is in darkness.

On top of that, the absence of environmental regulations concerning port activities is the basic constraint for the implementation of environment protection. This is, again, because of the personnel awareness of this matter.. Above all, the International Convention concerning pollution such as the IMDG Code, SOLAS
73/78, MARPOL, OPRC and Dumping Convention have not been adopted by the government.

It should be emphasised that due to the urgent need of the country's economic development, the government is likely to concentrate on economic rather than environmental issues.
### Table 7: Cargo handling performance of Sihanoukville Port

<table>
<thead>
<tr>
<th>No.</th>
<th>Nature of cargo</th>
<th>Mode of handling</th>
<th>Workmen number</th>
<th>Handling speed Ton/Unit per hour</th>
<th>Area of handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cement in pallet</td>
<td>Crane on board a ship</td>
<td>33</td>
<td>41.86 ton</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>2</td>
<td>House roof (Zinc)</td>
<td>Elevator</td>
<td>10</td>
<td>25 unit</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>3</td>
<td>House roof (phybro)</td>
<td>Elevator</td>
<td>10</td>
<td>8 unit</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>4</td>
<td>Fertilizers in pallet</td>
<td>Crane on board a ship</td>
<td>18</td>
<td>22.5 ton</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>5</td>
<td>Car</td>
<td>Crane on board a ship</td>
<td>12</td>
<td>22 unit</td>
<td>Ship to shore</td>
</tr>
<tr>
<td>6</td>
<td>Liquid in drum</td>
<td>Mobile crane</td>
<td>12</td>
<td>33 unit</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>7</td>
<td>Steel in bunch</td>
<td>Mobile crane</td>
<td>12</td>
<td>3.4 ton</td>
<td>Ship to truck</td>
</tr>
<tr>
<td>8</td>
<td>Cargo in container</td>
<td>Crane on board</td>
<td>5</td>
<td>9 TEU</td>
<td>Ship to shore</td>
</tr>
</tbody>
</table>

### Table 8: Movement of cargo in port area

<table>
<thead>
<tr>
<th>No.</th>
<th>Nature of cargo</th>
<th>Mode of transport</th>
<th>Amount of cargo per leg (ton/unit)</th>
<th>Transport time</th>
<th>Area of transport</th>
<th>Transport distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>House roof in unit</td>
<td>Tractor with trailor</td>
<td>4 unit</td>
<td>3 min</td>
<td>Wharf to warehouse</td>
<td>250 m</td>
</tr>
<tr>
<td>2</td>
<td>Cement/fertilizers in pallet</td>
<td>Truct</td>
<td>15 ton</td>
<td>6 min</td>
<td>Wharf to entry gate</td>
<td>350 m</td>
</tr>
</tbody>
</table>
CHAPTER SIX
PROPOSAL FOR IMPROVEMENT OF SIHANOUKVILLE PORT

Having analysed and assessed the problems of the existing situation of Sihanoukville Port, it needs to be backed up by an existing port organisation, management as well as operation. Port organisation, structure, job description and operational procedures and rules should be reviewed and evaluated to meet the changing port demand and technology. This chapter, hence, will be dealing with the way by which the improvement should take place.

I- Structure of Port Administration

Unfortunately, there is no general pattern for perfect form of administration to be followed. Nonetheless, considering the most successful pattern of other ports, the autonomous port is the most desirable.

In the view of the author, therefore, it is better to have an autonomous rather than a semi-autonomous port (the existing system). However, it does not mean that the government should leave responsibilities for the port in favour of an independent public body. On the contrary, it is just the exclusive form of administration and management.

The administration should be divided into two branches: a policy making body (a Board) and an executive branch composed of a managing director, a specialised department and the entire operating staff. Duties and responsibilities of
both parts of administration should be clearly defined and not overlapping and mentioned as follows:

- **The Board**

  The board should acts as a policy making body responsible to the government for the management of the port within the term of its legal status.

  The membership of the board should be divided in a certain proportion between representatives of the most interested government departments, and of business communities and port users. The MPWT, Ministry of Economy and Finance, Trade, Planning, Agriculture, Industry and Energy, Environment and Municipality are most likely to provide candidates for membership on behalf of the government. They should act, once appointed, according to their best judgement rather than on direct instruction from the government.

  Business members of the board should be appointed by the government from a brief list of candidates submitted by association of port users.

  To avoid the danger of special interest, a port managing director should be a member of the board with proved managerial abilities and an overall knowledge of the economic condition in the Cambodia.

  As a governing body of port administration, the board should have the ultimate responsibility for the proper functioning of the port. However, the current management should be delegated to executive officers under its guideline.

- **Port Authority**

  The port authority should be a separate autonomous body under a quite general overall supervision of the government. It should be in charge of current administration and development of the port, having the right to establish its own rules
and regulations, to select and appoint personnel in accordance with their capability. Further, it should have the right to establish tariffs and port dues, fix the rates within the framework of the general policy of the government. It should be able to lease some properties to private firms, to buy land adjacent to the port, to incur financial obligation in its own name (with a certain control of the government) and to act as a legal entity in general. The port authority should have a wide range attitude of freedom to find sufficiently experienced and qualified candidates to fill its main administrative posts including members of the board.

For efficiency, internal organisation of executive offices should be as clear and simple as possible, and should be based on the principle of delegation of the port authority. The number of specialised offices should be kept small in order to avoid undue dissipation and responsibilities. However, this number should cover all aspects related to port business. Furthermore, duplication and confusion of responsibilities among offices must be avoided. This means that officials on all levels of the administrative machinery should be fully aware who is responsible for what, and they should closely co-operate without trespassing on each others' duties.

Above all, division of activities and responsibilities between the field and executive offices should be arranged in a practical and pragmatic way rather than in accordance with preconceived rules. Figure 6 shows the proposed internal structure of Sihanoukville Port.

Apart from the modification of administrative form, Sihanoukville Port should delegate cargo handling activities to private companies. The discharge of these activities should take the following into consideration:

- Private cargo handling should come under some kind of licensing scheme in simplified form of declaration of intention to provide handling services.
Figure 6: Proposed Organisation Structure of Sihanoukville Port

- **BOARD OF COMMISSIONER**
  - EXECUTIVE DIRECTOR
    - EXECUTIVE ASSISTANT
      - VICE-DIRECTOR FINANCIAL & ADMINISTR.
        - ACCOUNTING
          - CASHIER
            - LEASE & RENT AND PURCHASE
              - PERSONNEL ADMIN. & PUBLIC RELATIONS
      - VICE-DIRECTOR COMMERCIAL
        - MARKETING
          - PRICING
      - VICE-DIRECTOR OPERATIONAL
        - HARBOUR MASTER
          - SAFETY AND ENVIRONMENT
      - VICE-DIRECTOR TECHNICAL
        - PLANNING
          - TRANSP. & WAREH. AND STEVEDORING
          - RESEARCH & DEVELOPMENT AND TRAINING
The declaration to be served by private contractors should state the nature of the service the contractor intend to provide. The declaration should also include undertaking on the part of contractor to prepare and make available detail statistics of his/her activities and to provide the port authority in confidence with a schedule of charges actually. This does not mean that charges made by the contractor should be subject to the approval of the port authority. They should, however, comply with the general pricing policy laid down by the government.

- As a safeguard against unsatisfactory performance including a reasonable charge on the part of private employers, the stevedoring activities should be undertaken by at least three different companies.

- For security purposes, especially in case of emergency like war, the port authority should be given legal power to perform stevedoring activities.

II- Personnel and Labour

As mentioned earlier the port is facing a problem of inadequate qualified personnel due to it unattractiveness by comparison with the private sector. Therefore, the government should make all efforts in recruiting suitable candidates, providing adequate training opportunities and offering reasonable conditions for employment including wages.

To achieve this goal, the port administration should have its own statute for personnel, possibilities of rapid promotion of capable officials and a reasonable level of salaries.

In recruiting candidates for responsible position, the port should consider their background (economic, technical, transportation, and port). In addition to that, energy and ability to deal with people should be taken into account.
Personnel should be kept currently informed on various developments in the field of cargo handling techniques, new methods in sea transport, trends in maritime trade and similar matters of general interest to port societies. A library with adequate books, publications on port interest matter should be available and easily accessible to all port employees.

Moral should be maintained by satisfactory physical arrangements, pleasant and stimulating conditions of work. Each employee should be encouraged to feel how useful his task is. He must be trusted and duly appreciated. In the sense of his responsibility, he should have a certain margin of independence.

Personnel should work as a team and every body should be well informed of the general policy, main goal of port activities and particular requirement and interest of their customers.

Earnst G.Frankel (1987, p.286) indicated the necessity of training as follows:

“Training is necessary from the port’s point of view, in order to obtain the required number of qualified workers, and more importantly, in order to adopt a smoothly to change in technology by maintaining and upgrading skills. Changing technology without careful planning, or change in organisation, without training will often result in disaster. Training will help in fulfilling worker’s self good of advancement.”

Training of port officials should start in the home port. Those who acquired great advantages should be sent to a foreign port for further training. After training, a few months of actual work in various departments before placing them in a particular
department should be provided. This will give them a good insight into the whole system of administration and operation.

The training program should be provided regularly to both old and new staff. However, the training duration of each group should be varied from one management level to another, and be scheduled in such a way that the port activities still remained without interruption.

Regarding labourers, they should be treated in similarity to the personnel. However, training should be in the particular field where they are going to be involved.

Due to the language barrier, training of labourers must be organised locally. Nevertheless, some foremen should be sent to better organised ports in the same region.

Professional training should be supplemented by a certain amount of general education so as to raise their skills level and interest in their profession. English classes should be provided to certain workmen such as warehousemen and dockers to be able to read signs and inscriptions on various packages. Labourers should be aware of the importance of their work and the various advantages it offers such as better payment, opportunities for training in more advanced jobs.

In order to promote labour productivity, the material incentives, such as a gradual scale of payment based on results should be applied. On top of this, workmen should be taken care of by the management in respect of their welfare during working hours and leisure periods. Hence, canteens, restrooms, clean toilets and showers should be provided close to the working area. Sports and other forms of recreation
should be encouraged. Attention should be paid to establishing proper sources of supply of food at acceptable prices, and to providing good medical care.

When the employment opportunities are declined and it is necessary to look for alternative work for workmen, consideration should be given to experienced workmen. A sufficient number of workmen should be employed permanently. This permanent labour force should be established in a correct proportion to the average daily demand, so that the idle days are kept at a reasonably low level, while the shortage of qualified labourers during higher traffic period remains the same.

Discipline and careful working habits should be maintained among workmen not only by their employers but also by themselves. They should be taught to take care of the property of clients and administration; to avoid damage and to strictly abide by fire prevention rules. A feeling of collective moral responsibility of the labourers for correct behaviour of its member should be promoted and encouraged.

III- Improvement of Port Finance and Dues

Sihanoukville Port is evolving rapidly due to the urgent economic development in Cambodia. This evolvement requires without some undue improvements, modification or outright extension of existing facilities. Only sound finances will enable the port administration to keep this evolvement.

Therefore, the port should as far as possible have reserve funds for unforeseen contingencies and for renewal and modernisation of port installations. It should find a good credit rating, based on a sound position of expenditure and revenues.

In the field of finance, therefore, the port administration should achieve and maintain a balance of revenues and expenses, within due provision for payment of
interest as well as for renewal and amortisation of equipment. A strict control should
be exercised for that purpose on the overall current expenditure; unnecessary
activities and formalities should be eliminated while productive work should be
organised in a rational and economic way. Simultaneously, all sources of current
revenues should be so organised as to provide a reasonable chance for an income
sufficient to slightly exceed the estimated cost of administration, port operation and
maintenance of port work.

Numerical estimates of expenditure and revenues should be made cautiously,
avoiding over-optimistic evaluation of exceeded incomes. Provision should be made
for unforeseen contingencies, resulting from factors beyond control of the
management.

The entire accounting system should be organised in a way that will make it
easy to determine the real cost of various activities within a port.

The principle of self-sufficiency should apply primarily to the ordinary budget.
In order to obtain a clear view over port activities, the ordinary budget should show
the expenditure of an overhead character separately (see Appendix3).

As far as the port dues are concerned, they should not be misinterpreted as
fiscal taxes and should never be allowed to acquire the character of taxes. They
should represent payment for the use of facilities and be assessed on all vessels, goods
entering and leaving a port. The level of dues should be in a reasonable proportion to
the value of available facilities to various categories of traffic.

Dues on cargo should cover current expenses connected with facilities on
land. All categories of dues should contain an element for covering general
administrative expenses of a port.
During severe congestion, port dues and tariffs may be high and benefit to users comparatively low. Conversely, during periods of low port facility utilisation, real port costs would actually be even higher but marginal port costs would be low, whereas users benefits would be high. In this regard, the negotiation over the use of port capacity should be applied during expected slack times at concessionary terms. Such negotiations should be open with all potential port users.

Revenues from all services such as tug assistance, cargo handling on shore, storage in transit sheds etc. should not be intended for general maintenance of port work but solely for covering the costs of relative services, including a reasonable overhead and profit.

Since the pilotage is compulsory, its dues have to be paid even if the vessel enter a port without a pilot. These dues, however, should be another kind of dues assessed on all vessels regardless of services rendered.

For a regular liner calling the port frequently, the rebate system should be applied. This is to encourage the line in arranging for schedules of calls at relatively short interval.

Vessels entering the port in ballast or for bunkering or repair should be either fully exempted from tonnage dues or asked to pay only minimum charge. Pilot dues, however, should be collected in full.

IV- Operational Improvement

1- Productivity Improvement

From Chapter V, it can be seen that productivity in handling operations is quite low, therefore it needs improvement. The improvement can be made via two aspects:
• Labour
• Facilities and Equipment, which will be discussed later on.

As far as the labour aspect is concerned, it can be done through the reduction in number of men per gang and on their training, which was described earlier.

Reduction in Number of Men Per Gang

Gary Crook & Ircha Mike (1994). Improving Terminal Development, Port Performance, Container):

"The objective of reduction in manpower can be achieved through one of the following ways:

• By natural wastage. This is often the most acceptable approach, but it takes times to achieve it full effect and often bring problems of adjustment. It is not always the unqualified people that opt to leave.
• Through an early retirement scheme. Again this can be unpredictable and its consequences and does, of course, involve expenses; government is sometimes prepared to assist a scheme.
• Through a voluntary redundancy scheme. Once more, the same problems of unpredictability and cost arise. The scheme may be financed by port authority, by central government or by rising a levy on cargo handled.
• Through a compulsory scheme, although this can give more predictable results, as the employer controls, which employees should leave, it is inevitably very unpopular and again imposed a financial burden in competition payment.
• Through job creation. Men might be transferred to offdock facilities or ICD or might be re-engaged in container clearing, repair
and refurbishing operation. This could cause the more painful aspects of reducing manpower on terminal operation.”

Like other developing countries, in Cambodia, the reduction in manpower is a very difficult job because the entire work force has been employed by the government since 1979. Therefore it is not easy to change the people’s mind over a short period of time. In addition to that, social factors should be considered. Generally, each family has an average number of 8 members. The reduction in manpower in any big institution like a port might bring notable social impact because the entire family will suffer.

Having considered the foresaid impacts, it is advisable to go for an early retirement scheme.

2- Customs Procedure and Documentation

As emphasised in Chapter IV, clearance procedures and documentation create delays in the cargo traffic through the port due to delay in the examination of goods (working hours) and many documents. Therefore, this delay should be modified. To overcome this problem, unnecessary document on many different desks should be avoided. Further, it is advisable to store cargo waiting for customs clearance in a separate warehouse, while the documentation flow should be rationalised. Above all, the working hours of the clearance committee should be unlimited whereby incentive such as extra payment for working overtime should compensate their hardship.

V- Improvement of Facilities and Equipment

As emphasised earlier, the facilities and equipment used in Sihanoukville Port required an improvement to be able to be used in effective and efficient ways. In this context, a port, first of all, should modify the existing facilities and equipment to accommodate the characteristics of material-handling requirements.
The warehouse roof should be repaired, the pavement should be re-prepared and re-organised to be able to store different types of cargo appropriately. The bunker and water supply should also be repaired and re-organised to meet any demand of any ship. Above all, dredging of approaching areas and channels to the new wharf should be done.

As far as the equipment is concerned it should be technically and economically studied to judge if it should be disposed of or replaced by new equipment. If the replacement is required, the port should select the right equipment in terms of size and mobility including consideration on efficiency and compatibility. However, it should be borne in mind that the modern equipment needs/requires highly skilled workers/staffs in should be avoided in order to be easily used and maintained.

It is also important that, the equipment pool should be as standard as possible, thus reducing the cost of maintenance and repair as well as capital tied up in spare parts.

Aside from that the improvement of facilities mentioned above, the port should also have a container port.

In planning a container terminal, the port should consider its dimension as to keep it in proportion not only to existing traffic but also the expected traffic. Its quay should be strong enough to absorb wheel pressure of high speed mobile cranes used for shifting container between dockside and storage area.

Although space must be left for rapid movements of containers carrying equipment, covered space is required for occasional opening of containers for customs inspection or for repairing damage during transport. Therefore the shed of
the adopted dimension should be erected for this purpose, preferably just beyond the container yard.

Apart from that, the type of container terminal should be selected carefully. Several alternatives should be examined in order to find the most economic and at the same time the most efficient system. Costs of construction and costs of various types of equipment must be compared without loosing sight of the economy of future operations. It is highly advisable to consult specialists well familiar with handling container, in addition to civil engineering consultants. Opinion of interested large users should also be sough.

VI-Improvement of Legislation

As indicated earlier, the port has certain legislation, but inappropriate, regarding port management and operations; thus, the following legislation should be modified and developed:

1- Port organisation and administration: this legislation should have a clearly outlined administrative structure with an indication of key officials required and the allocation of functions and powers between the respective units and officials.

2- Port structure and installation: this legislation should clearly specify the responsibilities of the port in regards to building, maintenance and operation of harbour structure and facilities.

3- Aid to navigation: this legislation should specify the power and obligation of the port authority mandated to perform functions in relation to aid to navigation and related equipment.
4- Danger to navigation: this legislation should clarify the obligation of the port to ensure that any obstruction or matter in port (or other approaches thereto), which constitute a danger to navigation, is removed.

5- Wreck removal: this legislation should specify the power and responsibility of the port to remove wrecks and other obstructions near or within the port where such wrecks or obstruction are likely to impede navigation or present a hazard to the users or marine environment.

6- Maintenance of depth in port: this legislation should clarify the power and requirement to the port to
   - deepen, dredge, scour and improve the bed and foreshore of the harbour and
   - undertake dredging operations in order to maintain the navigational channels of the port.

7- Access of vessel to port: this legislation should oblige the port to permit, or deny if necessary, among foreign and local vessels in respect of the grant of access to the port.

8- Stays of vessels in port: this legislation should include the extent and limits of the power of the port (Harbour Master) to give general or special direction to vessels in port and the procedures for enforcing such direction including sanction for non-compliance.

9- Provision of accommodation for vessels: this legislation should specify the power of the port (Harbour master) to determine the condition and procedures for the provision and use of accommodation in port.
10- Pilotage: this legislation should spell out clearly the law applicable to pilotage and in particular, the right and obligation of pilots and shipmaster vis a vis each other.

11- Tug services: this legislation should contain clearly the charges levied on ships using a tug, the methods used by the port to enforce payment, and the liability of these two parties vis a vis each other.

12- Safety requirements: this legislation should specify the responsibility of the port to deny access to a ship if that ship does not meet applicable safety requirement as set out in national laws. This responsibility and power should also include the power to prevent a vessel from leaving the port, provisions requiring other persons operating in the port area to follow the relevant procedures stipulated in the legislation.

13- Pollution prevention: this legislation should indicate clearly the relationship of the port with other relevant agencies as well as the procedures and arrangements for the co-ordination of the respective activities of the various bodies and agencies.

14- Maintenance of dangerous substances: this legislation should specify the power of the port to control the entry of dangerous goods, to make regulations for the safe handling of various categories of these goods, and the requirement to establish and maintain emergency plans and arrangements for dealing with incidents involving dangerous goods at berth and in the storage areas within the port area.

15- Harbour craft: this legislation should specify the power and responsibility of the port in licensing craft operating in the port area and the provision for their safe operation.
16- Port security: this legislation should cover the prevention and detention of criminal activities in a port which affect vessels and persons or goods on board; the provision of assistance to law enforcement agencies, particularly for the prevention and control of illegal acts, illicit drug trafficking and terrorism and criminal activities.

17- Port dues and charges: this legislation should primarily grant to the port the power to establish port tariffs, indicate the procedures to be followed for publishing port tariff including the requirements to give prior notice of revision of that tariff and to make their copies to those who may be affected; provision on penalties for failure to pay applicable dues and charges; and the power of the port to prevent vessels to be moved from the port without payment of applicable dues and charges; provision granting a lien in respect of some dues and charges.

18- Relation and co-ordination with other state agencies: this legislation should indicate the extent and limit of the power of a port to liaise and co-operate with other agencies.

It should be mentioned that it is advisable refer on international conventions such as, SOLAS, MARPOL, OPRC, the IMDG code drafted by IMO (International Maritime Organisation) and adopted by member states as an excellent reference in establishing the legislation concerning safety, pollution prevention and maintenance of dangerous cargo.

VII- Improvement of Environmental Management

As has been stated earlier, the government should create a legislation on safety requirements, pollution prevention and maintenance of dangerous substances. In addition to that, however, any measures against adverse impacts, especially from ship
traffic and discharge, and cargo operations should be developed and carried out by the port authority. These measures are as follows:

1- Measures against impacts from ship traffic and discharge
For proper control of emission and effluents from ships, the port authority should regulate ship discharge and provide sufficient reception facilities. These facilities should be categorised serving different types of wastes: garbage, cargo hold waste from dry cargo vessel, sewage, and oil chemical wastes; the charges for their use should be minimum and be included in port dues. The provision of reception facilities should be organised in such a way that they do not cause any delay to vessels in using them. It is suggested that the use of reception facilities should be made mandatory and that requirements should be enforced. Since accidental spills are unavoidable, recovery vessels, oil fence and treatment chemicals should be prepared with a view to minimising dispersal. Proper contingency plans and prompt reporting systems are keys to prevention of oil dispersal. These plans should
- identify priorities of treatment
- investigate available resources from local, regional and national groups, identify the circumstances of a spillage when such a response would be needed.
- investigate the location and deployment of available equipment
- identify suitable means for disposal of estimated debris
- define special equipment and product requirements, and provide for their acquisition and maintenance
- provide for training of personnel
- establish the authority and responsibilities of individuals in the event of a spill.
- establish a policy for response, including the legal framework for damage assessment, compensation and clean-up costs.
As far as the maintenance and repairs are concerned, they may lead to pollution due to activities such as painting, scrapping, grit or water blasting. Water and grit used for these activities are contaminated and thus, should not be dumped. It is recommended, therefore, that the port authority should attach conditions to permit certain repairs to be carried out.

2- Measures against impacts from cargo operations

The port should take appropriate measures against impacts on water and air quality, noise and vibration, and visual quality.

To prevent contamination of water and air quality, the port authority should take measures against runoff by: a/ covering or closing raw material storage area; b/ sprinkling water on raw materials except anti-humid materials; c/ providing special equipment for transport and handling (e.g. pneumatic unloader); and d/ other methods to reduce the influence of wind and rain.

With respect to prevention of noise and vibration, the port authority should adopt low noise equipment or install a sound insulation fence (green belt of plants).

As far as the impact on visual quality is concerned, the design of a storage area concealed from roads or the nearby community can reduce excess lighting and improve the view. To this effect, a green belt zone may be beneficial.

Regarding safety, the port should provide, in addition to tug and pilot assistance, systems of assistance for arriving vessels. Taking into consideration traffic, vessel types, sizes and ship destination, such systems should include

- aids to navigation in the approaches to the port
vessel traffic services, separation and routing schemes (adequate separation of vessels where vessel density pattern and trackline present the potential for disaster and establishment of mechanisms such as traffic circles where needed).

With respect to dangerous substances, they should be stored separately, incorporating safety features to prevent accidents. In the event of an accident security measures such as fire protection equipment and catchment facilities should be in place along with procedures to prevent the risk of degradation of hazardous substances, their packages and marking.

Where storage is planned, the warehouse keepers should show the nature of the dangerous substances in each part of the storage facilities. Apart from that, consideration should be given to the condition of storage (temperature, and pressure) avoiding potential sources of ignition (smoking, welding, shrink and wrapping equipment). Above all he should ensure that all relevant legislative requirements and applicable codes of practice for the safe storage of hazardous substances are strictly applied where applicable.
CONCLUSION

So far, the existing organisation and management of Sihanoukville Port and its problems have been described. Undoubtedly, from these the author has found that the existing problems are characterised by the lack of an overall long-term policy, insufficient resource allocation, non-availability of experienced and man power for consultancy, lack of field studies, planning, design and supervision; inadequate management organisation; labour management practices and asset management. Notwithstanding, these problems still lie in the two key elements, "HUMAN" (technical and know-how skilled people) and "CAPITAL" (infrastructure and superstructure; and finance) Resources. As a result, this solitary sea-port for Cambodia needs to be improved and developed.

Unfortunately, improvement and development are not easy tasks and not be accomplished overnight. It takes quite a long time to offset the human development problems. Aboveall, it is obviously difficult to change the people’s minds in a short period of time, especially those many people who have long been reluctant at works within a long period of time. On top of that, capital development will require a good insight on the future demand for the port in order to allocate proper equipment and financial resources. There needs to be a good understanding of what prospect is and the following questions need to be answered :”What is needed? Where should be founded?, Why it is needed? and How can it be provided?” These answers will perhaps be very difficult for Sihanoukville Port to provide that lacks in necessary skilled people.

However, there are many opportunities and possibilities to remove these constraints provided they are seriously addressed by the government.
Human resource development can be achieved through training schemes at every managerial level and the employee's motivation can be improved through financial and other incentives. The first case includes sending top level managers to developed countries for studies in advanced ports and training the rest of the managerial staffs locally with trainers from advanced schools or experts from advanced ports.

Capital resource development can be accomplished by studying and following the experience of successful developed countries. This can improve developmental policies, build up infrastructure and develop management policies to conform to the realities directed and the requirements of Cambodia, adjusting them to suit its stage of development.

It is not an easy job, however it is not impossible. Regarding the concept "Development", it should be considered as a process which requires step-by-step methods and needs devoted people to change their mind. Changing the people's minds does not cost anything and their contribution can be tremendous. If everybody can do a little, it means we can do a lot. Furthermore, the foremost objective of the development policy must be to speed up this process.

Apart from that, one should bear in mind that development is a never-ending process. It keeps going on. The importance of this is even greater for the port—the place where a great variety of developed and developing nations meet to trade their commodities in efficient manner.

Remember "The port is the only that place gives an access for international trade. There are no alternative means for this. Inadequate emphasis of the port means isolating the country from international communities, penalising national prosperity and economic development, and deteriorating quality of life for the people".
Also remember that the product of the port is not like that of other commercial activities, such as fisheries, forestry or agriculture. It is a service. This product is bought only if it meets the demands of consumers (shippers). Unsurprisingly, their demands are RELIABILITY, SAFETY and COST EFFICIENCY. Only sound management, organisation and effective performance can meet these demands.
### Appendix 1: Port Traffic by Commodities, 1993

<table>
<thead>
<tr>
<th>Import</th>
<th>Tonnes</th>
<th>Export</th>
<th>Tonnes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General cargo</td>
<td>28,763</td>
<td>General cargo</td>
<td>5,190</td>
<td>3</td>
</tr>
<tr>
<td>Machinery</td>
<td>2,276</td>
<td>Logs</td>
<td>6,933</td>
<td>5</td>
</tr>
<tr>
<td>Fertiliser</td>
<td>23,897</td>
<td>Sawn timber</td>
<td>96,021</td>
<td>63</td>
</tr>
<tr>
<td>Cement</td>
<td>137,295</td>
<td>Rubber</td>
<td>492</td>
<td>0</td>
</tr>
<tr>
<td>Rice</td>
<td>10,449</td>
<td>Scrap iron</td>
<td>7,406</td>
<td>5</td>
</tr>
<tr>
<td>Metal</td>
<td>2,554</td>
<td>Construction material</td>
<td>36,151</td>
<td>24</td>
</tr>
<tr>
<td>Sugar</td>
<td>4,295</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction material</td>
<td>89,546</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>23,119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>322,194</td>
<td><strong>Total</strong></td>
<td>152,193</td>
<td>100</td>
</tr>
</tbody>
</table>

| COMBINED TOTAL          | IMPORT AND EXPORT | 474,388 |
| % share                 | 68                | 32      |

Source: SwRoad in association with Lan Xang International and Mari Term
### Appendix 2: Port Traffic 1979-94

<table>
<thead>
<tr>
<th>Year</th>
<th>General Cargo</th>
<th></th>
<th>Bulk Cargo</th>
<th></th>
<th>POL</th>
<th></th>
<th>Container</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Import</td>
<td>Export</td>
<td>Total</td>
<td></td>
<td>Import</td>
<td>Export</td>
<td>Total</td>
<td>ton</td>
</tr>
<tr>
<td>1979</td>
<td>2,795</td>
<td>69,781</td>
<td>72,576</td>
<td></td>
<td>291,526</td>
<td>190,526</td>
<td></td>
<td></td>
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<tr>
<td>1980</td>
<td>1,725</td>
<td>289,801</td>
<td>291,526</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>5,032</td>
<td>185,695</td>
<td>190,526</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>14,335</td>
<td>115,473</td>
<td>129,828</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>2,182</td>
<td>95,142</td>
<td>97,324</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>7,979</td>
<td>110,448</td>
<td>118,427</td>
<td>118,427</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>11,544</td>
<td>104,642</td>
<td>116,186</td>
<td>116,186</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>8,017</td>
<td>121,463</td>
<td>129,480</td>
<td>129,480</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>17,466</td>
<td>143,931</td>
<td>161,397</td>
<td>161,397</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>19,466</td>
<td>187,787</td>
<td>207,253</td>
<td>207,253</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>83,999</td>
<td>177,931</td>
<td>263,930</td>
<td>263,930</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>83,659</td>
<td>200,069</td>
<td>283,727</td>
<td>283,727</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>6,883</td>
<td>22,357</td>
<td>29,240</td>
<td>79,991</td>
<td>22,225</td>
<td>102,216</td>
<td>1,095</td>
<td>132,351</td>
</tr>
<tr>
<td>1992</td>
<td>211</td>
<td>54,994</td>
<td>55,203</td>
<td>77,139</td>
<td>146,536</td>
<td>223,675</td>
<td>5,112</td>
<td>283,992</td>
</tr>
<tr>
<td>1993</td>
<td>5,190</td>
<td>28,372</td>
<td>33,563</td>
<td>147,003</td>
<td>270,312</td>
<td>417,315</td>
<td>23,119</td>
<td>474,387</td>
</tr>
<tr>
<td>1994</td>
<td>101,231</td>
<td>418,323</td>
<td>522,415</td>
<td>8,560</td>
<td>532,415</td>
<td>1,341</td>
<td>10,620</td>
<td>21,186*</td>
</tr>
</tbody>
</table>

**Note:**
- * This figure also includes empty containers
- The statistical data during the period of 1979 to 1990 and 1995 is not broken down by cargo (general, bulk or POL cargo)
- Container statistic from 1979-1990 was not recorded.
- the POL volume of 1994 is estimated by port.

## Appendix 3: Typical Pattern of Ordinary Budget

### Breakdown (Expenditure and Revenue)

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Ship Related Revenues</td>
<td>1- Port Facilities / Services Used by Ships</td>
</tr>
<tr>
<td>- pilotage fees</td>
<td>- pilotage</td>
</tr>
<tr>
<td>- port dues</td>
<td>- fixed marine facilities</td>
</tr>
<tr>
<td>- wharfage</td>
<td>- building</td>
</tr>
<tr>
<td>- channel user dues</td>
<td>- channels and basin</td>
</tr>
<tr>
<td>- towage</td>
<td>- administration and general expenses</td>
</tr>
<tr>
<td>- mooring and docking</td>
<td>- towing boats</td>
</tr>
<tr>
<td>- water, electricity, telephone supply</td>
<td>- water, electricity, gas</td>
</tr>
<tr>
<td>- miscellaneous</td>
<td>- depreciation</td>
</tr>
<tr>
<td>2- Land and Building Charges</td>
<td>2- Land and Handling Related Cost</td>
</tr>
<tr>
<td>- rent for storage areas and land</td>
<td>- land maintenance cost</td>
</tr>
<tr>
<td>- rent for building</td>
<td>- building maintenance</td>
</tr>
<tr>
<td>- miscellaneous income</td>
<td>- depreciation</td>
</tr>
<tr>
<td>3- Financial and Interest Revenues</td>
<td>3- Financial Costs</td>
</tr>
<tr>
<td>- interest on deposits</td>
<td>- interest cost on borrowing</td>
</tr>
<tr>
<td>- exchange income</td>
<td>- taxes and dues</td>
</tr>
<tr>
<td>- profit on disposal of assets</td>
<td>- losses and write-off</td>
</tr>
<tr>
<td>- income from investment</td>
<td>- bad debts</td>
</tr>
<tr>
<td>- miscellaneous</td>
<td>- charges by bank/other financial institutions</td>
</tr>
<tr>
<td>4- Administrative Cost</td>
<td>4- Administrative Cost</td>
</tr>
<tr>
<td>- general administration</td>
<td>- general administration</td>
</tr>
<tr>
<td>- engineering and planning</td>
<td>- engineering and planning</td>
</tr>
<tr>
<td>- consulting and other service</td>
<td>- consulting and other service</td>
</tr>
<tr>
<td>- computer and communication service</td>
<td>- computer and communication service</td>
</tr>
<tr>
<td>- hiring and firing service</td>
<td>- hiring and firing service</td>
</tr>
<tr>
<td>- depreciation</td>
<td>- depreciation</td>
</tr>
<tr>
<td>- entertainment and marketing costs</td>
<td>- entertainment and marketing costs</td>
</tr>
<tr>
<td>- personnel expenditure</td>
<td>- personnel expenditure</td>
</tr>
<tr>
<td>- travel</td>
<td>- travel</td>
</tr>
<tr>
<td>- sundry expenses such police, medical etc</td>
<td>- sundry expenses such police, medical etc</td>
</tr>
</tbody>
</table>

Appendix 4: Some Sample of Sihanoukville Port Tariff Charges and Dues

1. Stevedoring Charge

<table>
<thead>
<tr>
<th>No.</th>
<th>Cargo Categories</th>
<th>Charge Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>US$/Tonnes</td>
</tr>
<tr>
<td>1</td>
<td>Cargo in bulk, metal, ores, gravel block stone, foodstuff, fertiliser, salt, raw sugar</td>
<td>1.46</td>
</tr>
<tr>
<td>2</td>
<td>Cargo in cotton, paper or nylon bags</td>
<td>1.58</td>
</tr>
<tr>
<td>3</td>
<td>Machinery equipment, empty container, empty pallet or container, logs</td>
<td>2.12</td>
</tr>
<tr>
<td>4</td>
<td>Cargo in drum, cases or bundle, rolls, sheets, bars, plates</td>
<td>2.32</td>
</tr>
<tr>
<td>5</td>
<td>Cargo in bales (raw cotton, jute, humps, rush paper, textile, cloths, household utensils miscellaneous)</td>
<td>2.45</td>
</tr>
<tr>
<td>6</td>
<td>Sawn timber, flooring stripers, wooden bamboo ware</td>
<td>2.52</td>
</tr>
<tr>
<td>7</td>
<td>Cargo in baskets</td>
<td>2.65</td>
</tr>
<tr>
<td>8</td>
<td>Fragile materials, crystal, glass, ceramics, pots, valuable cargo such as TV, camera</td>
<td>2.81</td>
</tr>
<tr>
<td>9</td>
<td>Fresh fruits, livestock, frozen product</td>
<td>2.92</td>
</tr>
<tr>
<td>10</td>
<td>Special and valuable cargo (gold, silver, diamond, motor-car, trucks, heavy weight and long construction materials)</td>
<td>4.97</td>
</tr>
<tr>
<td>11</td>
<td>Container</td>
<td>US$/Unit</td>
</tr>
<tr>
<td></td>
<td>- 1 TEU</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>- 1 FEU</td>
<td>115</td>
</tr>
</tbody>
</table>

2. Other charges

<table>
<thead>
<tr>
<th>No.</th>
<th>Charge Categories</th>
<th>Charge Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(US$/GRT)</td>
</tr>
<tr>
<td>1</td>
<td>Pilotage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- for sea port</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>- for refinery port</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>- for each shifting</td>
<td>0.017</td>
</tr>
<tr>
<td>2</td>
<td>Berthage</td>
<td>(US$/GRT)</td>
</tr>
<tr>
<td></td>
<td>2.1. for vessels stay less than 5 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- at quay</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>- at buoy</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>- at anchorage</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>2.2. for tourism, service vessel</td>
<td>(US$/hrs)</td>
</tr>
<tr>
<td></td>
<td>- at quay</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>- at buoy</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>- at anchorage</td>
<td>0.0005</td>
</tr>
<tr>
<td>3</td>
<td>Channel dues</td>
<td>(US$/GRT)</td>
</tr>
<tr>
<td></td>
<td>- for commercial vessel</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>- for lighter carrier</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Source: Sihanoukville Port Authority
Bibliography


*Determination of Area in Sihanouk Ville 1994* (Cambodia).


Prakas No 239 MT on Port Dues and Stevedoring Charge Tariff 1987 (Cambodia).

Regulation on Foreign vessels calling at Cambodia’s Ports 1983 (Cambodia).


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